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(NASA-CR-63214) LUNAR ORBIT RENDEZVOUS
REFERENCE TRAJECTORY DATA PACKAGE, ISSUE 4,
VOLUME 2E (Bellcomm, Inc.) 56 p

N79-71941

00/13 12245 Unclas

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[REDACTED] Reference No. 64-2020

BELLCOMM, INC.

265-5890

TR-64-209-3

LUNAR ORBIT RENDEZVOUS REFERENCE

TRAJECTORY DATA PACKAGE (U)

REFERENCE TRAJECTORY NO. 2
(GUIDED RE-ENTRY)

[U]

Issue 4
Volume 2E

September 10, 1964

[REDACTED]
Approved: *R.J. Wagner*
Trajectory Analysis Department

Work Performed for Manned Space Flight, National Aeronautics
and Space Administration as part of Task 9 under Contract
NASw-417

GROUP [REDACTED]
Downgraded [REDACTED] intervals;
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ABSTRACT

This report, Reference Trajectory No. 2 (Guided Reentry) is issued as volume 2E of Lunar Orbit Reference Trajectory Data Package (U), Issue 4. The first four volumes prepared by Space Technology Laboratories are as follows.

Volume 2A - Summary and Reference Trajectory No. 2 Data Exhibits, dated July 22, 1964, No. 8408-6061-RC-000

Volume 2B - Printout Keys and Reference Trajectory No. 2 Listing (Earth Launch to LEM Final Descent), dated July 22, 1964, No. 8408-6062-RC-000

Volume 2C - Reference Trajectory No. 2 Listing Continued (LEM Final Descent to Earth Re-entry), dated July 22, 1964, No. 8408-6063-RC-000

Volume 2D - Reference Trajectory No. 2 Listing Concluded (Re-entry), dated July 22, 1964, No. 8408-6064-RC-000

The above volumes contain a complete unguided reference trajectory including the re-entry phase. This report (volume 2E) contains a guided re-entry with the same terminal conditions as the unguided re-entry of volume 2D.

GUIDED RE-ENTRY

The Reference Trajectory Data Package to which this is appended contains an "open loop" (unguided) Apollo LOR trajectory. For the powered flight maneuvers the full optimized steering orders of the "open loop" trajectory result in good first approximations to the final guided trajectories. In the reentry phase the correspondence between the "open loop" and guided trajectories is less close. The intent of this volume is to present the resultant LOR re-entry trajectory parameters as influenced by the closed loop control of the MIT re-entry guidance logic.

The guidance logic utilized is that defined by MIT as of July 1, 1964. The characteristics of the vehicle restated from Volume 2A are;

$$L/D \text{ max} = .4$$

$$\frac{W}{C_D A} = 57 \text{ lbs/sq. ft.}$$

$$W = 9500.0$$

ATMOSPHERE MODEL = U.S. Standard ATMOSPHERE, 1962

The re-entry phase is initiated 10,511.7 min. from lift-off. At the point of re-entry the vehicle has a longitudinal range to go of 1073.5 naut. miles and a lateral range to go of 72 naut. miles to reach the landing site located at 18.5 degrees N latitude, 212.3 degrees E longitude. For this range a skip from the atmosphere is not required, therefore, the re-entry profile consists of an initial full positive lift

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phase to "pull up", a second phase in which the flight profile is influenced by "constant drag" guidance and a third and final phase in which the flight profile reflects the "equilibrium glide" guidance mode.

This volume contains the printout and print key plus plotted time histories of several important trajectory parameters. The equivalent information for the "open loop" reentry trajectory is contained in Volumes 2A and 2D.

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OUTPUT KEY FOR GUIDED RE-ENTRY

X Components of the missile position in an earth centered, right handed, inertial coordinate system.

Y The system is oriented such that the X-Z plane contains the true vernal equinox of date and the X-Y plane contains the equator. The Z axis passes through the north pole. (ft)

XD Components of velocity in the earth centered inertial coordinate system. (ft/sec)

YD

ZD

XL Components of the landing site position in the earth centered inertial coordinate system. (ft)

YL

ZL

ALT Altitude with respect to the Fischer ellipsoid 1960, measured along the radius vector. (ft)

R Radial distance from the center of the earth. (ft)

RDOT Component of inertial velocity along the radius vector R. (ft/sec)

VI Magnitude of the inertial velocity. (ft/sec)

FPAI Flight path with respect to VI. Angle between the inertial velocity vector and the local geocentric horizontal, positive upward (deg.)

PSIV Azimuth from north of the inertial velocity vector projected on a plane normal to the radius vector. (deg.)

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VA	Magnitude of the velocity relative to the air mass. (ft/sec)
FPA _A	Flight path with respect to the VA. Angle between the air velocity vector and the local geocentric horizontal, positive upward. (deg.)
PSAV	Azimuth from north of the air velocity vector projected on a plane normal to the radius vector. (deg.)
LAT	Geodetic latitude of the vehicle position. (deg.)
LONG	Longitude of the vehicle position. (deg.)
RTGN	Right ascension of the landing site from the vehicle position vector measured in the instantaneous plane of motion. The angle is projected to the surface of a spherical earth. (naut. mi.)
RTGL	Declination of the landing site relative to the instantaneous plane of motion. The angle is projected to the surface of a spherical earth. (naut. mi.)
ACC	Magnitude of the total acceleration vector (ft/sec ²)
DRAG	Magnitude of the aerodynamic drag force acting along the relative velocity vector VA. (lbs.)
FLY	Magnitude of the aerodynamic lift force acting normal to the relative velocity vector VA and in the instantaneous relative plane of motion. (lbs.)
FLP	Magnitude of the aerodynamic lift force acting normal to the relative velocity vector VA and normal to the instantaneous relative plane of motion. (lbs.)
GLOAD	Ratio of the magnitude of the aerodynamic acceleration to the magnitude of the gravitational acceleration.

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ROLL Roll attitude. Angle between the lift vector (defined in a plane normal to the relative velocity vector) and the line of intersection of the relative plane of motion and the plane normal to the relative velocity vector. Positive 0 to 360 degrees counter clockwise as viewed from the rear of the vehicle. 0 degrees representing maximum lift up in the relative plane of motion.
(deg.)

RLDOT Magnitude of the roll rate. (deg/sec)

TAG Guidance phase indicator (1 to 6)
1 - guidance phase prior to initial pull up
2 - guidance targeting iteration phase
(determines guidance strategy) This phase occurs at the point of pull up, requiring approximately 300 to 500 milliseconds of time to complete.
3 - guidance "constant drag" or "reference trajectory" phase. For various range requirements either one or both of these phases may be required.
5 - guidance atmospheric skip phase. This phase may or may not exist as ranging requirements dictate.
6 - guidance equilibrium glide phase

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M. I. T. GUIDANCE

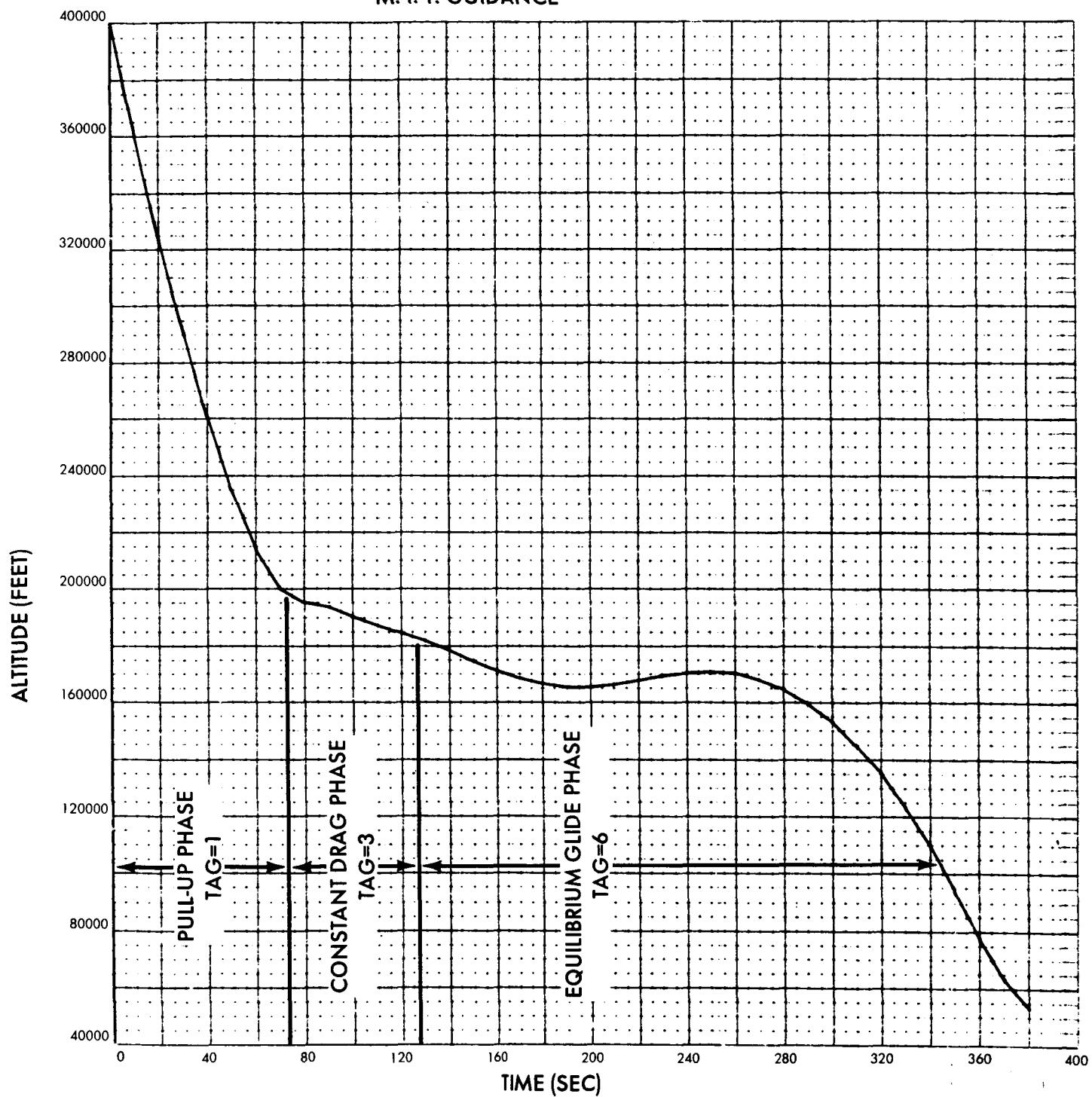


FIGURE 1 ALTITUDE

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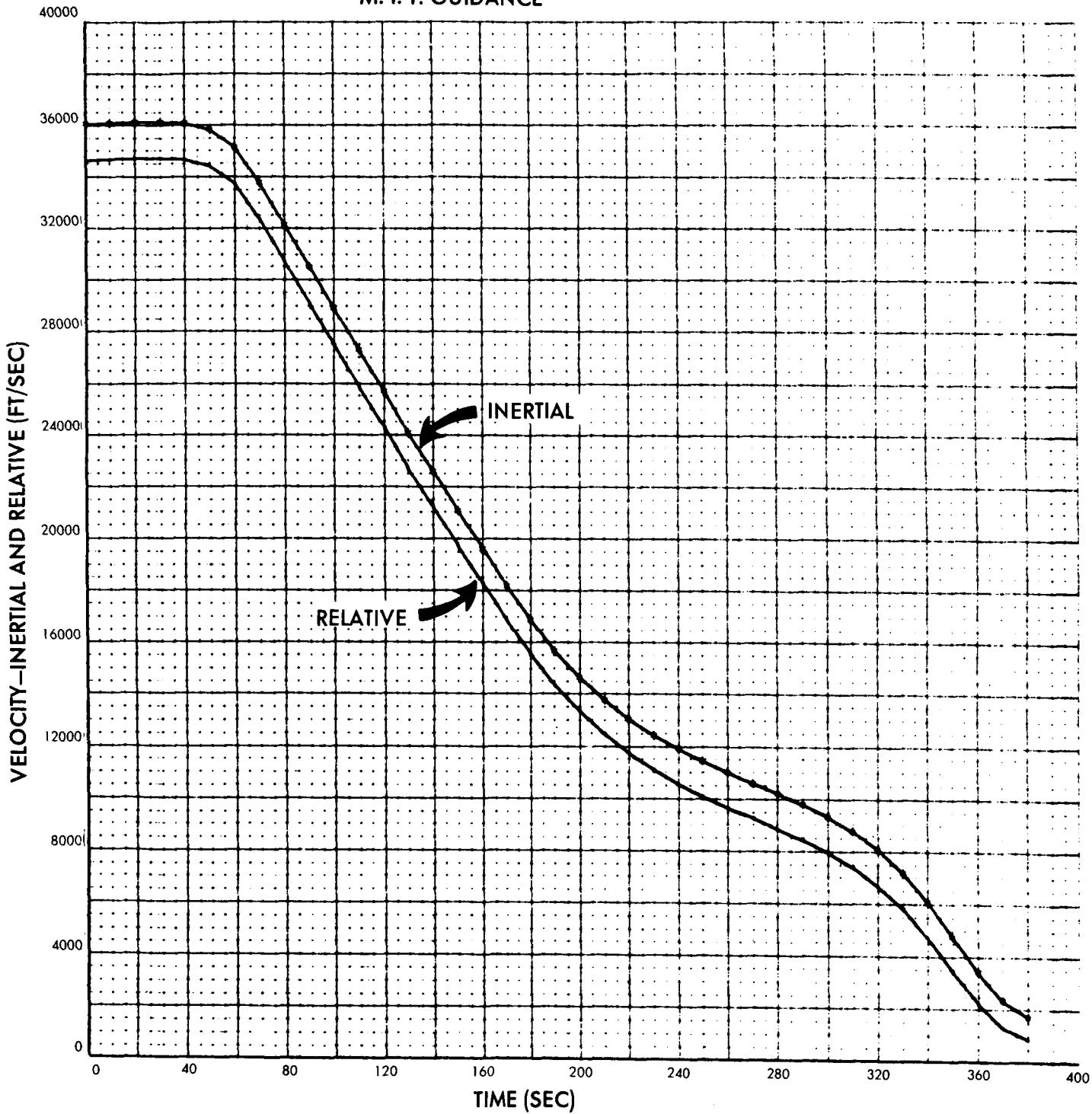


FIGURE 2 INERTIAL AND RELATIVE VELOCITY

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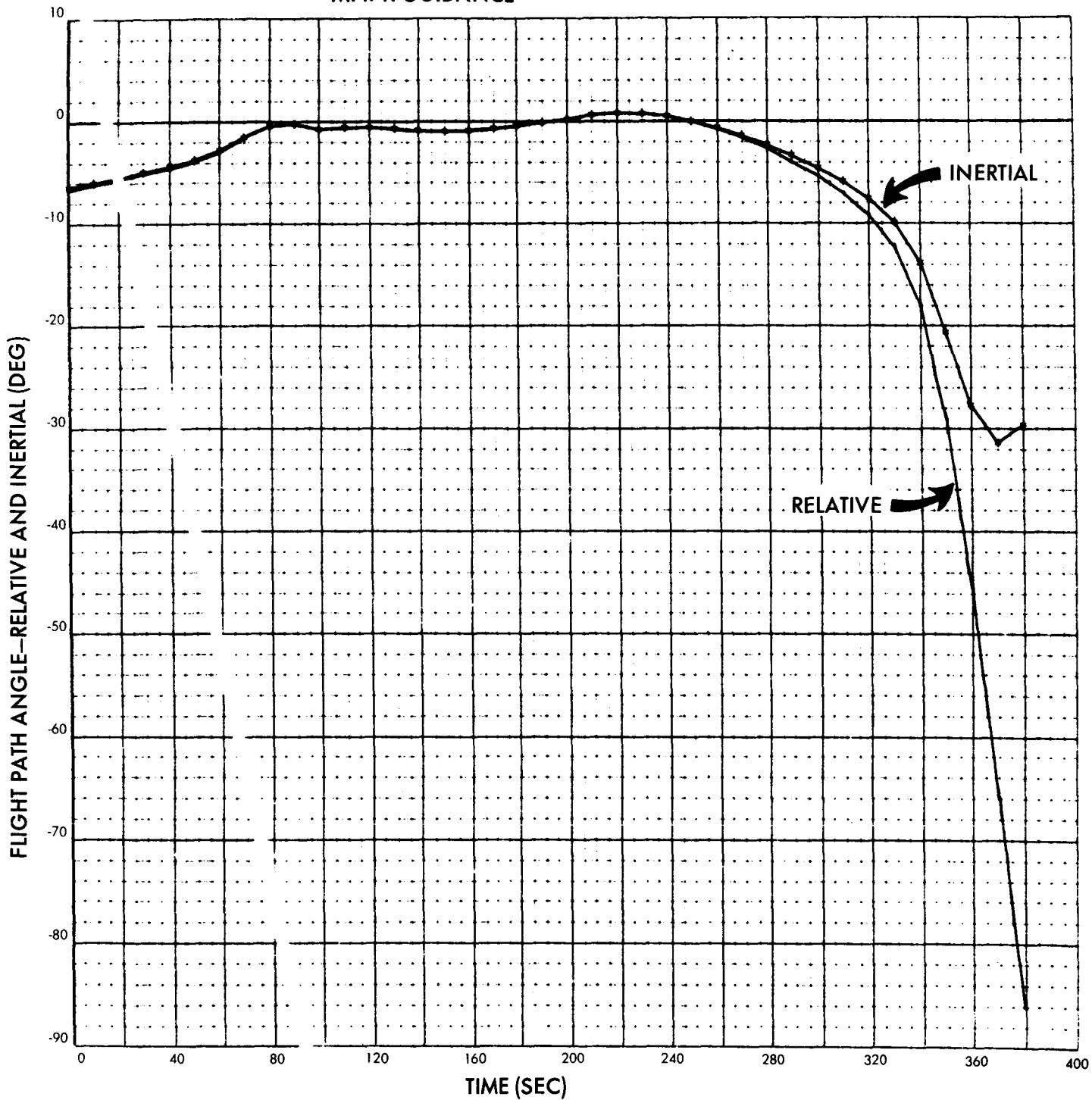


FIGURE 3 INERTIAL AND RELATIVE FLIGHT PATH ANGLE

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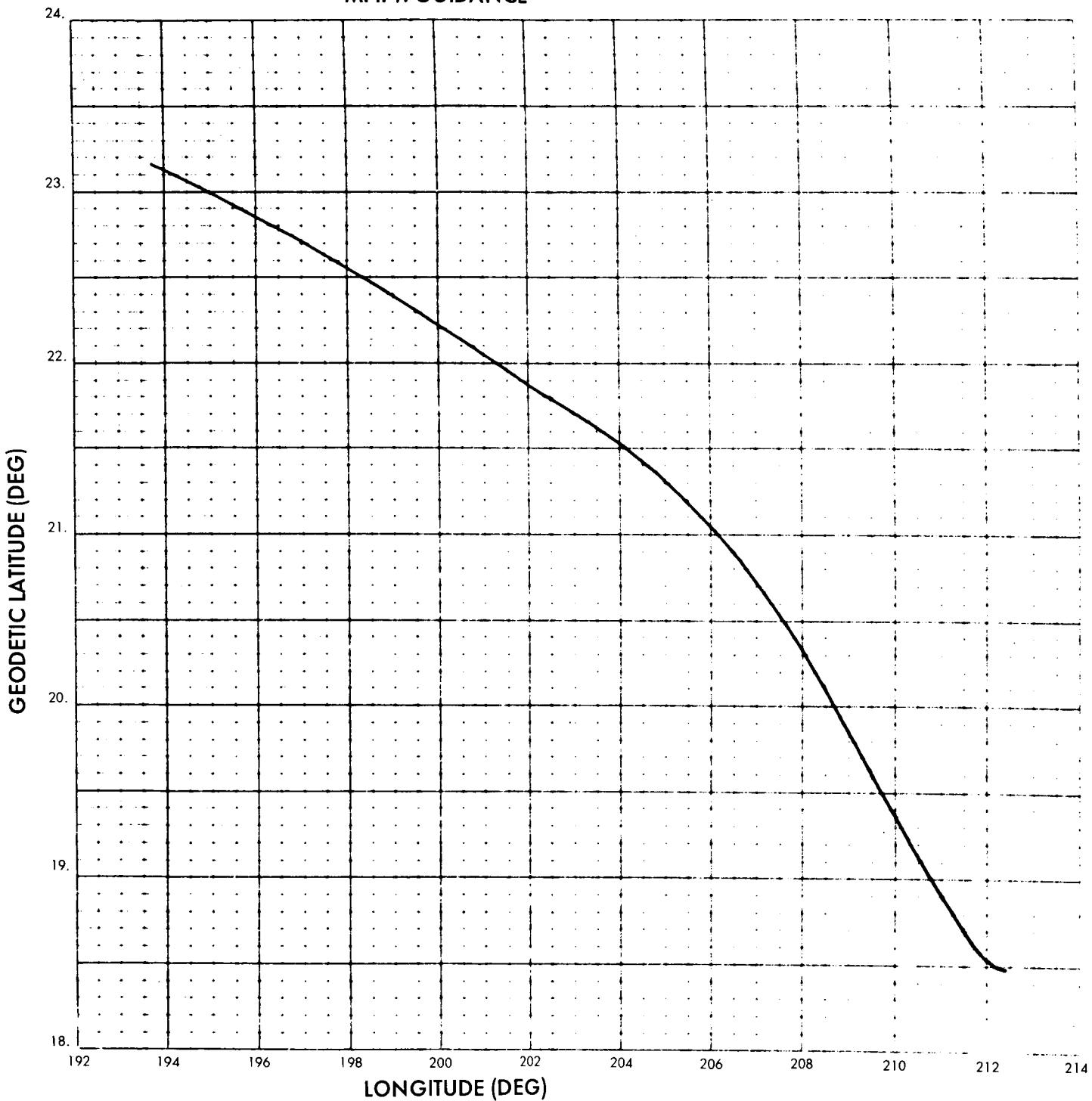


FIGURE 4 GEODETIC LATITUDE AND LONGITUDE

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6.

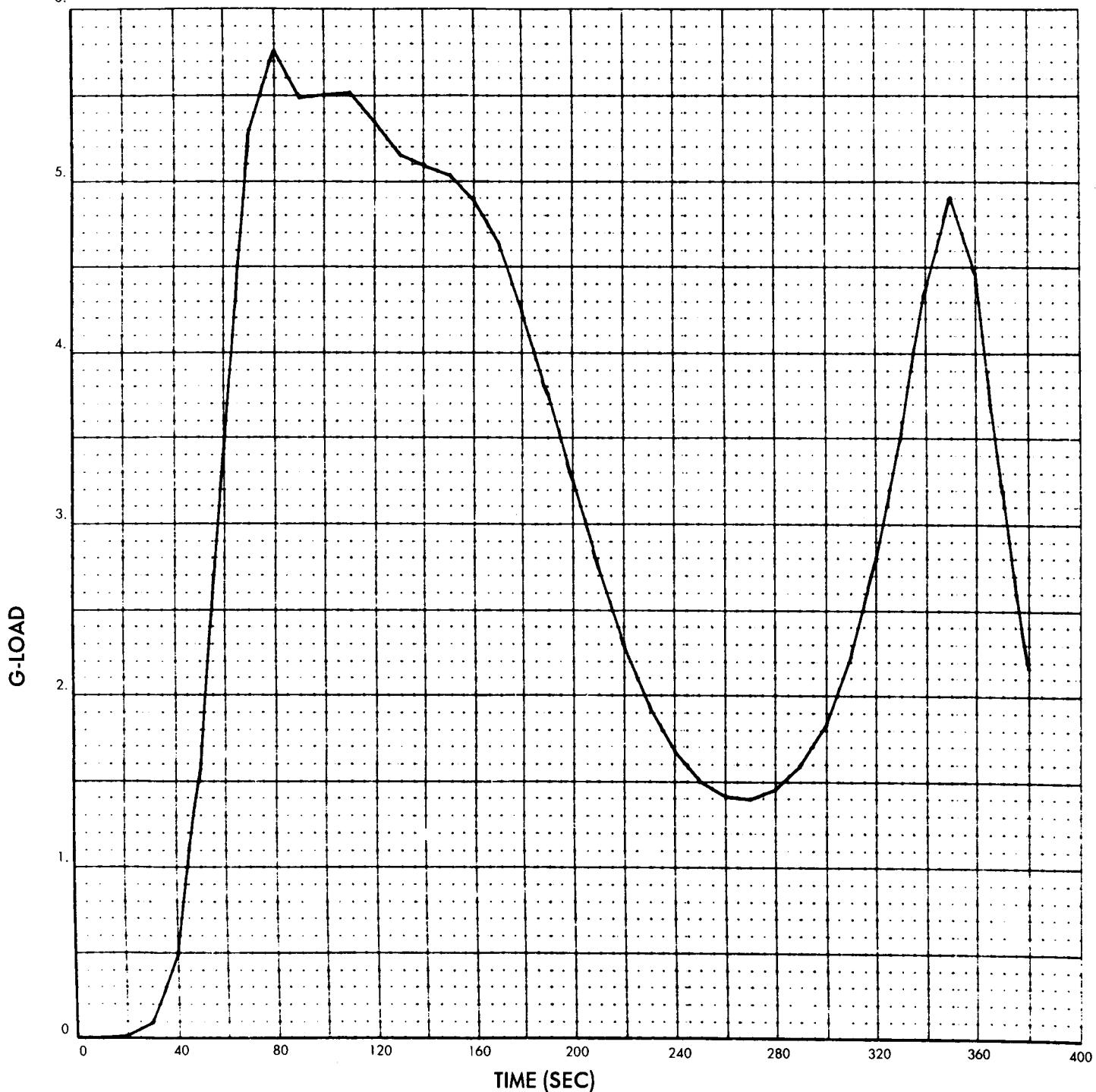


FIGURE 5 G-LOAD

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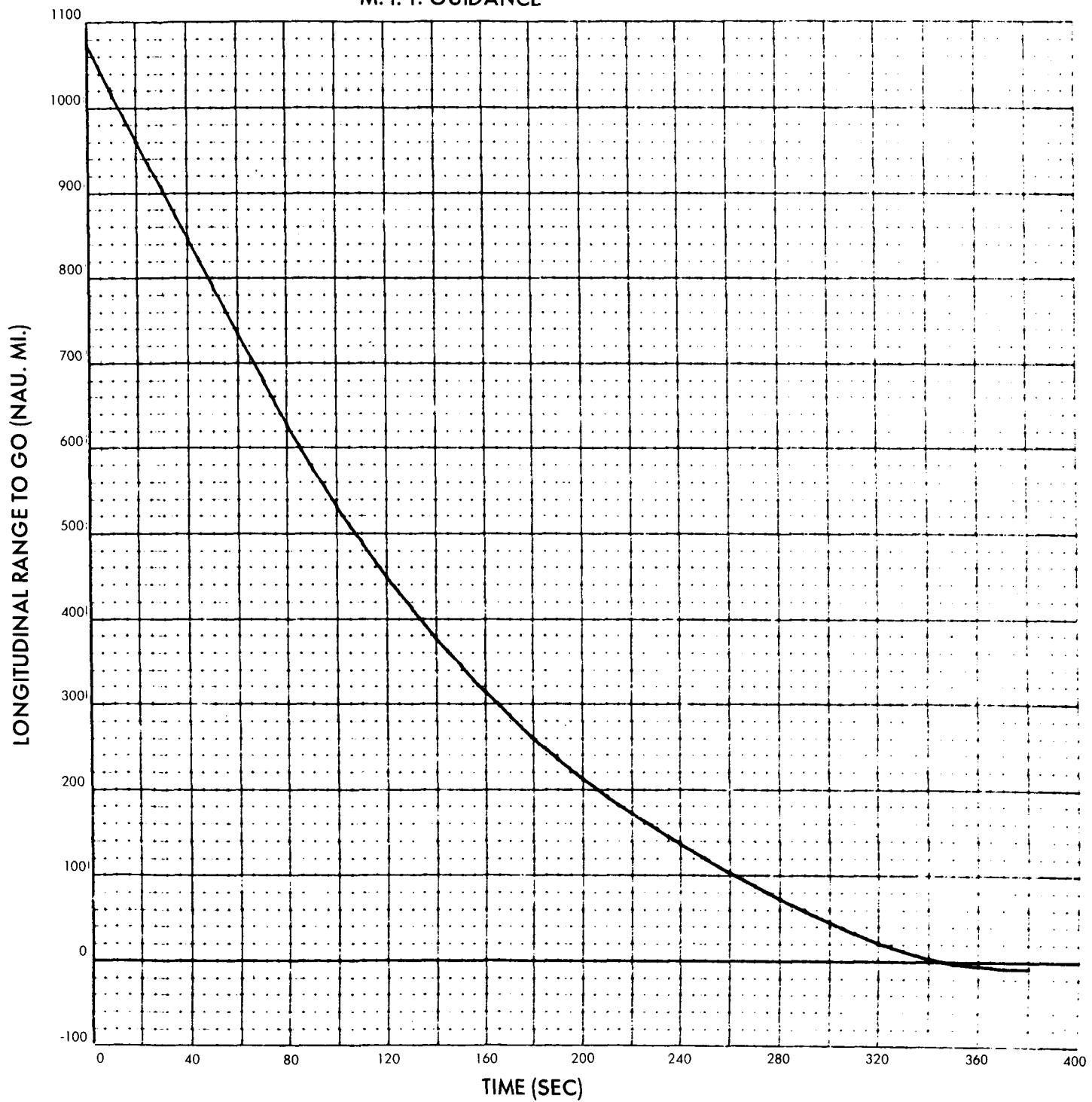


FIGURE 6 LONGITUDINAL RANGE TO GO

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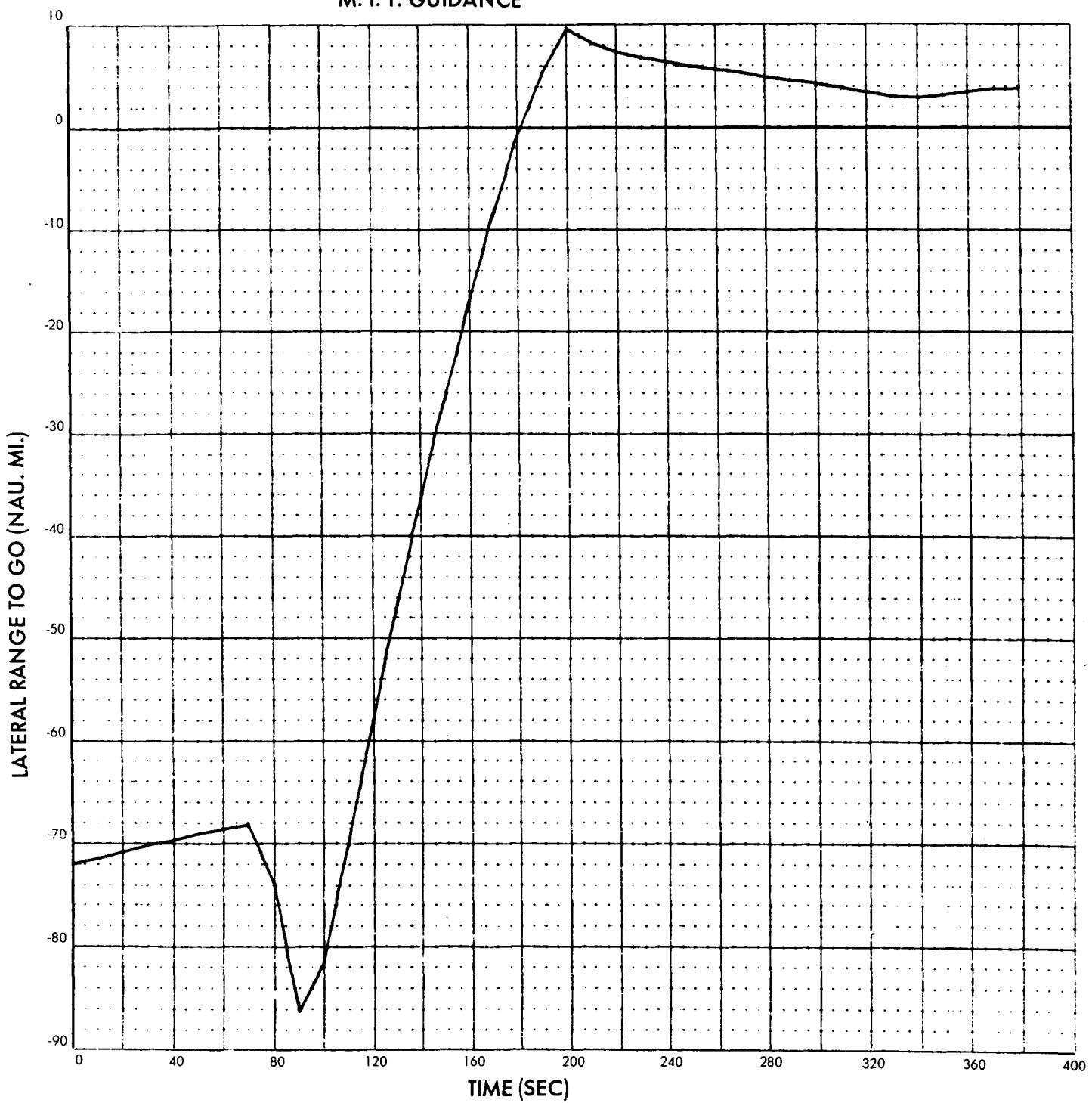


FIGURE 7 LATERAL RANGE TO GO

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M. I. T. GUIDANCE

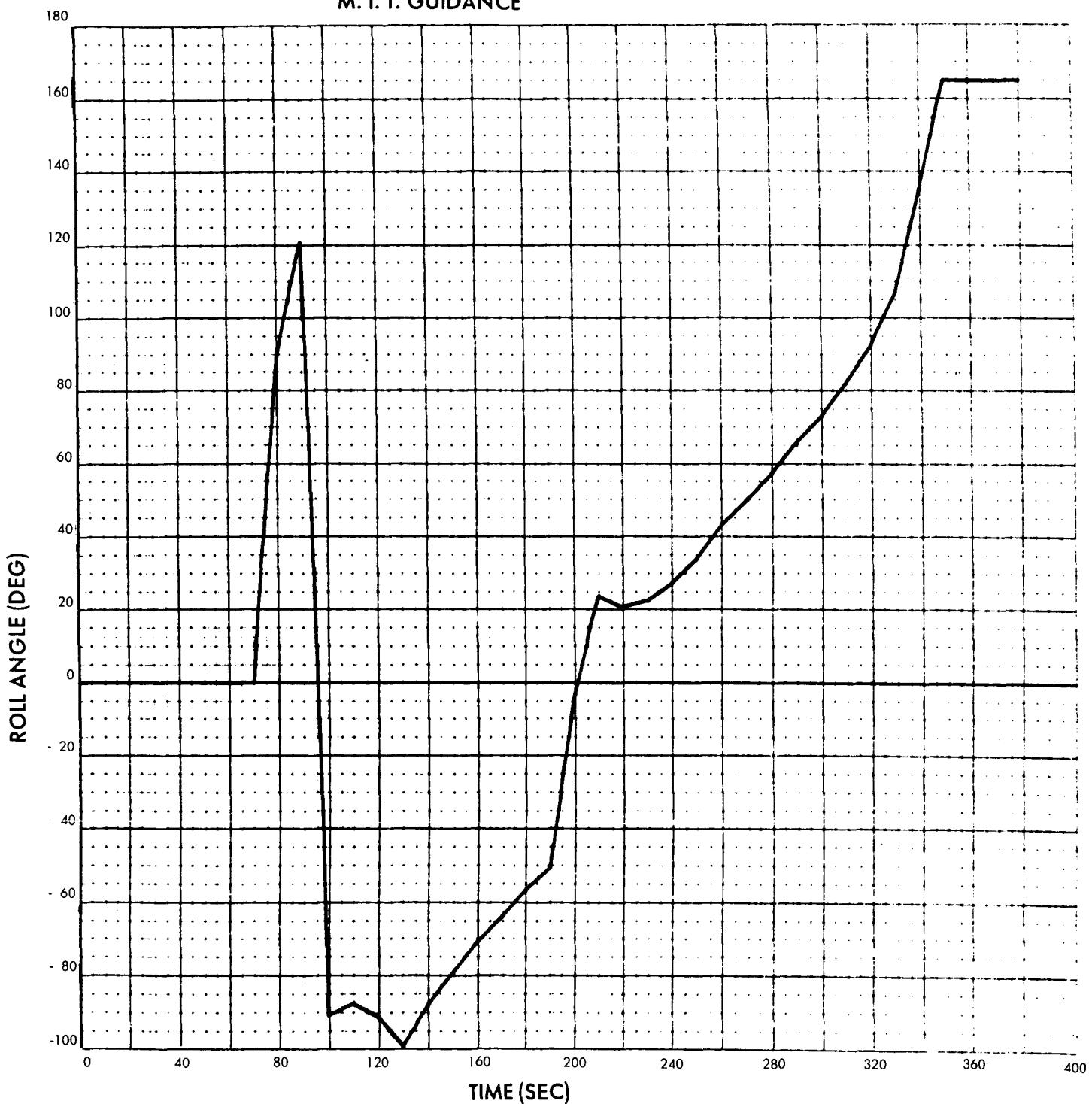


FIGURE 8 ROLL ATTITUDE

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EV 1
 OR 0
 1.997 0.
 EQUAL TO 0.
 0.
 -0.
 = 0.36055044E 05
 VELOCITY
 FLIGHT PATH ANGLE = -0.64005213E 01

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JOB	CHB5
HEADING ANGLE	= 0.97522172E 02
LATITUDE OF THE RE-ENTRY POINT	= 0.23160835E 02
LONGITUDE OF THE RE-ENTRY POINT	= -0.16626605E 03
LATITUDE OF THE LANDING SITE	= 0.18539361E 02
LONGITUDE OF THE LANDING SITE	= -0.14773743E 03
L/D MAXIMUM OF THE VEHICLE	= 0.40000000E-00
RLMIN	= 0.15000000E 02 F0D = 0.30000000E-00 CK2L = 0.10000000E 01
RL1	= 0.50000000E 01 CLAT = 0.15000000E-01 CK3L = 0.10000000E 01
RL2	= 0.20000000E 02 C1 = 0.10000000E 01 CK1P = 0.50000000E 00
DRL	= 0.11000000E 02 CK050 = 0.86712392E 05 CK2P = 0.15000000E 01
HMAX	= 0.10000000E 07 CEIA = 0.10000000E 04 CK3P = 0.50000000E 00
HMIN	= 0.50000000E 05 CP2 = 0.50000000E-01 CK3AP = 0.25000000E-00
DIF	= 0.50000000E 01 CS = 0. VMIN = 0.15000000E 05
GMAX	= 0.32200000E 03 SG = 0. CK11P = 0.
DMIN	= 0.10000000E 01 CT = 0.10000000E-04 CK12P = 0.
DIPK	= 0.10000000E 01 CK13P = 0.20000000E 01
YRTH	= 0.10000000E 04 C9 = 0.
VRCT	= 0.70000000E 03 C10 = 0.
C12	= 0.92255255E 05 C13 = 0.30000000E 05 C23 = 0.15000000E 05
C14	= 0.10000000E 03 RR = 0.21202900E 08 C16 = 0.10000000E-01
C17	= 0.20000000E-03 C18 = 0.10000000E 04 C19 = 0.13000000E 03
C20	= 0.17500000E 03 C24 = 0.30000000E 02 C22 = 0.10000000E 01
HS	= 0.28500000E 05 CK11 = 0.20000000E-00 FEHD = 0.20000000E-00
12	
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1 AUG. 1969 22 HR 17 MIN 9.11 SEC TMST 630704.8281 J.D. 244 435.4285 7 DAY 7 HR 11.7 MIN
X = -0.93192291E 07 XD = -0.30371961E 05 ALT = 0.40000025E 06 LAT = 0.23160833E 02 VI = 0.36055044E 05
Y = 0.17262429E 08 YD = -0.18515707E 05 R = 0.21314963E 08 LONG = 0.19373395E 03 FPAI = -0.64005420E 01
Z = 0.83359562E 07 ZD = -0.58888703E 04 RDOT = -0.40193562E 04 FLP = 0. PSIV = 0.97522180E 02
XL = -0.14493994E 08 TAG = 0.10000000E 01 GLOAD = 0. FLY = 0.14476477E 01 VA = 0.34566543E 05
YL = 0.13567375E 08 ROLL = 0. ACC = 0. RTGN = -0.72075633E 02 FPAA = -0.66619018E 01
ZL = 0.66133917E 07 RLDDOT = 0. DRAG = 0.36191193E 01 RTGL = 0.10735128E 04 PSAV = 0.97833978E 02

1 AUG. 1969 22 HR 17 MIN 14.23 SEC TMST 630709.9453 J.D. 244 435.4286 7 DAY 7 HR 11.8 MIN
X = -0.94747062E 07 XD = -0.30301770E 05 ALT = 0.37972725E 06 LAT = 0.23094957E 02 VI = 0.36072369E 05
Y = 0.17167207E 08 YD = -0.18644103E 05 R = 0.21294748E 08 LONG = 0.19424450E 03 FPAI = -0.61576084E 01
Z = 0.83056162E 07 ZD = -0.59511328E 04 RDOT = -0.38692586E 04 FLP = 0. PSIV = 0.97730224E 02
XL = -0.14499063E 08 TAG = 0.10000000E 01 GLOAD = 0.78448805E-03 FLY = 0.32507231E 01 VA = 0.34664548E 05
YL = 0.13561958E 08 ROLL = 0. ACC = 0.31053259E 02 RTGN = -0.71768548E 02 FPAA = -0.64087126E 01
ZL = 0.66133917E 07 RLDDOT = 0. DRAG = 0.81268078E 01 RTGL = 0.10450226E 04 PSAV = 0.98050118E 02

1 AUG. 1969 22 HR 17 MIN 19.36 SEC TMST 630715.0703 J.D. 244 435.4286 7 DAY 7 HR 11.9 MIN
X = -0.96298197E 07 XD = -0.30230140E 05 ALT = 0.36022375E 06 LAT = 0.23027172E 02 VI = 0.36088926E 05
Y = 0.17071327E 08 YD = -0.18772038E 05 R = 0.21275304E 08 LONG = 0.19475551E 03 FPAI = -0.59141395E 01
Z = 0.82742572E 07 ZD = -0.60133001E 04 RDOT = -0.37185310E 04 FLP = 0. PSIV = 0.97937881E 02
XL = -0.14504130E 08 TAG = 0.10000000E 01 GLOAD = 0.21015145E-02 FLY = 0.78789270E 01 VA = 0.34681762E 05
YL = 0.13556539E 08 ROLL = 0. ACC = 0.31091068E 02 RTGN = -0.71461514E 02 FPAA = -0.61550061E 01
ZL = 0.66133917E 07 RLDDOT = 0. DRAG = 0.19697318E 02 RTGL = 0.10164772E 04 PSAV = 0.98265854E 02

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1 AUG.	1969	22	HR	17 MIN	24.36 SEC	TMSI	630720.0703	J.D.	244 435.4287	7 DAY	7 HR 12.0 MIN
X	= -0.97807926E 07	XD	= -0.30158762E 05	ALT	= 0.34194075E 06	LAT	= 0.22959198E 02	VI	= 0.36104149E 05		
Y	= 0.16977156E 08	YD	= -0.18896236E 05	R	= 0.21257080E 08	LONG	= 0.19525445E 03	FPAI	= -0.56759930E 01		
Z	= 0.82447394E 07	ZD	= -0.60737894E 04	RDOT	= -0.35708018E 04	FLP	= 0.	PSIV	= 0.98140062E 02		
XL	= -0.14509072E 08	TAG	= 0.10000000E 01	GLOAD	= 0.52198469E -02	FLY	= 0.18815773E 02	VA	= 0.34697802E 05		
YL	= 0.13551249E 08	ROLL	= 0.	ACC	= 0.31099890E 02	RTGN	= -0.71162017E 02	FPA	= -0.59068850E 01		
ZL	= 0.66133917E 07	RLDOT	= 0.	DRAG	= 0.47039434E 02	RTGL	= 0.98857697E 03	PSAV	= 0.98475906E 02		

1 AUG.	1969	22	HR	17 MIN	29.48 SEC	TMSI	630725.1953	J.D.	244 435.4287	7 DAY	7 HR 12.0 MIN
X	= -0.99351651E 07	XD	= -0.30083769E 05	ALT	= 0.32396775E 06	LAT	= 0.22887646E 02	VI	= 0.36118298E 05		
Y	= 0.16879989E 08	YD	= -0.19022474E 05	R	= 0.21239170E 08	LONG	= 0.19576622E 03	FPAI	= -0.54309736E 01		
Z	= 0.82134531E 07	ZD	= -0.61354537E 04	RDOT	= -0.34184702E 04	FLP	= 0.	PSIV	= 0.98346829E 02		
XL	= -0.14514136E 08	TAG	= 0.10000000E 01	GLOAD	= 0.13616595E -01	FLY	= 0.48169708E 02	VA	= 0.34712357E 05		
YL	= 0.13525826E 08	ROLL	= 0.	ACC	= 0.31034245E 02	RTGN	= -0.70855035E 02	FPA	= -0.56516426E 01		
ZL	= 0.66133917E 07	RLDOT	= 0.	DRAG	= 0.12042427E 03	RTGL	= 0.95992907E 03	PSAV	= 0.98590733E 02		

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1 AUG. 1969 22 HR 17 MIN 39.48 SEC TMST 630735.1953 J.D. 244 435.4289 7 DAY 7 HR 12.2 MIN

X = -0.10235238E 08 XD = -0.29927902E 05 ALT = 0.29116275E 06 LAT = 0.22742580E 02 VI = 0.36134635E 05

Y = 0.16688562E 08 YD = -0.19259786E 05 R = 0.21206491E 08 LONG = 0.19676552E 03 FPAI = -0.49459320E 01

Z = 0.81515074E 07 ZD = -0.62524520E 04 RDOT = -0.31153703E 04 FLP = 0. PSIV = 0.98748670E 02

XI = -0.14524010E 08 TAG = 0.10000000E 01 GLDAD = 0.88836840E-01 FLY = 0.31281576E 03 VA = 0.34729795E 05

YI = 0.13535238E 08 ROLL = 0. ACC = 0.30165411E 02 RTGN = -0.70257528E 02 FPAA = -0.51465253E 01

ZI = 0.66133917E 07 DRAG = 0.78203941E 03 RTGL = 0.90389835E 03 PSAV = 0.99108347E 02

1 AUG. 1969 22 HR 17 MIN 44.61 SEC TMST 630740.3203 J.D. 244 435.4289 7 DAY 7 HR 12.3 MIN

X = -0.10388390E 08 XD = -0.29836669E 05 ALT = 0.27554400E 06 LAT = 0.22665478E 02 VI = 0.36126375E 05

Y = 0.16589572E 08 YD = -0.19367717E 05 R = 0.21190939E 08 LONG = 0.19727777E 03 FPAI = -0.46871378E 01

Z = 0.81193207E 07 ZD = -0.63071129E 04 RDOT = -0.29520586E 04 FLP = 0. PSIV = 0.98953541E 02

XI = -0.14529067E 08 TAG = 0.10000000E 01 GLDAD = 0.21300743E-00 FLY = 0.74978083E 03 VA = 0.34722041E 05

YI = 0.13529810E 08 ROLL = 0. ACC = 0.28991206E 02 RTGN = -0.69953570E 02 FPAA = -0.4871580E 01

ZI = 0.66133917E 07 DRAG = 0.18744521E 04 RTGL = 0.87512859E 03 PSAV = 0.99321439E 02

1 AUG. 1969 22 HR 17 MIN 49.61 SEC TMST 630745.3203 J.D. 244 435.4290 7 DAY 7 HR 12.4 MIN

X = -0.10537317E 08 XD = -0.29729850E 05 ALT = 0.26114100E 06 LAT = 0.22588515E 02 VI = 0.36089874E 05

Y = 0.16492516E 08 YD = -0.19449372E 05 R = 0.21176603E 08 LONG = 0.19777720E 03 FPAI = -0.44172208E 01

Z = 0.80876697E 07 ZD = -0.63511395E 04 RDOT = -0.27795951E 04 FLP = 0. PSIV = 0.99152371E 02

XI = -0.14533992E 08 TAG = 0.10000000E 01 GLDAD = 0.47449777E-00 FLY = 0.16624862E 04 VA = 0.34685975E 05

YI = 0.13524511E 08 ROLL = 0. ACC = 0.28151645E 02 RTGN = -0.69661201E 02 FPAA = -0.45963826E 01

ZI = 0.66133917E 07 RLDOT = 0. DRAG = 0.41562156E 04 RTGL = 0.84704514E 03 PSAV = 0.99528561E 02

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1 AUG.	1969	22	HR	17 MIN	54.61 SEC	TMST	630750.3203	J.D. 244 435.4290	7 DAY 7 HR 12.5 MIN	
X	= -0.10685637E 08	XD	= -0.29592094E 05	ALT	= 0.24765200E 06	LAT	= 0.22509931E 02	VI	= 0.36002528E 05	
Y	= 0.16395149E 08	YD	= -0.19488615E 05	R	= 0.21163182E 08	LONG	= 0.19827573E 03	FPAI	= -0.41162835E 01	
Z	= 0.80558372E 07	ZD	= -0.63783940E 04	RDOT	= -0.25842944E 04	FLP	= 0.	PSIV	= 0.99349678E 02	
XL	= -0.14538929E 08	TAG	= 0.10000000E 01	GLOAD	= 0.89346152E 00	FLY	= 0.31284280E 04	VA	= 0.34598978E 05	
YL	= 0.13519211E 08	ROLL	= 0.	ACC	= 0.31647759E 02	RTGN	= -0.69376061E 02	FPA	= -0.42835710E 01	
ZL	= 0.66133917E 07	RDOT	= 0.	DRAG	= 0.78210701E 04	RTGL	= 0.81897938E 03	PSAV	= 0.99734682E 02	
1 AUG.	1969	22	HR	17 MIN	59.61 SEC	TMST	630755.3203	J.D. 244 435.4291	7 DAY 7 HR 12.5 MIN	
X	= -0.10833160E 08	XD	= -0.29407403E 05	ALT	= 0.23521825E 06	LAT	= 0.22429888E 02	VI	= 0.35836895E 05	
Y	= 0.16297738E 08	YD	= -0.19462452E 05	R	= 0.21150817E 08	LONG	= 0.198717241E 03	FPAI	= -0.37678149E 01	
Z	= 0.80239290E 07	ZD	= -0.63797058E 04	RDOT	= -0.23549638E 04	FLP	= 0.	PSIV	= 0.99544780E 02	
XL	= -0.14543857E 08	TAG	= 0.10000000E 01	GLOAD	= 0.15273359E 01	FLY	= 0.533988382E 04	VA	= 0.34433583E 05	
YL	= 0.13513910E 08	ROLL	= 0.	ACC	= 0.44610140E 02	RTGN	= -0.69102304E 02	FPA	= -0.39216034E 01	
ZL	= 0.66133917E 07	RDOT	= 0.	DRAG	= 0.13347096E 05	RTGL	= 0.79098344E 03	PSAV	= 0.99939448E 02	
19	1 AUG.	1969	22	HR	18 MIN	4.61 SEC	TMST	630760.3203	J.D. 244 435.4291	7 DAY 7 HR 12.6 MIN
20	X	= -0.10979601E 08	XD	= -0.29156772E 05	ALT	= 0.22404150E 06	LAT	= 0.22348632E 02	VI	= 0.35560464E 05
21	Y	= 0.162006679E 08	YD	= -0.19343129E 05	R	= 0.21139710E 08	LONG	= 0.19926587E 03	FPAI	= -0.33521904E 01
22	Z	= 0.79921016E 07	ZD	= -0.63442411E 04	RDOT	= -0.20793036E 04	FLP	= 0.	PSIV	= 0.99736718E 02
23	XL	= -0.145468783E 08	TAG	= 0.10000000E 01	GLOAD	= 0.23766539E 01	FLY	= 0.82865865E 04	VA	= 0.34157259E 05
24	YL	= 0.13508606E 08	ROLL	= 0.	ACC	= 0.67742043E 02	RTGN	= -0.68844700E 02	FPA	= -0.34900047E 01
25	ZL	= 0.66133917E 07	RDOT	= 0.	DRAG	= 0.20716467E 05	RTGL	= 0.76313644E 03	PSAV	= 0.10014233E 03

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MOORE BUSINESS FORMS, INC.

FORM 1413 PRINTED IN U.S.A.

1 AUG. 1969 22 HR 18 MIN 9.61 SEC TMST 630765.3203 J.D. 244 435.4292 7 DAY 7 HR 12.7 MIN

X = -0.11124589E 08 XD = -0.28823477E 05 ALT = 0.2143775E 06 LAT = 0.22226514E 02 VI = 0.35145055E 05

Y = 0.16104495E 08 YD = -0.19109171E 05 R = 0.21130116E 08 LONG = 0.19975428E 03 FPAI = -0.28519463E 01

Z = 0.79605636E 07 LD = -0.62627220E 04 RDOT = -0.17486528E 04 FLP = 0. PSIV = 0.99924374E 02

X1 = -0.14553708E 08 TAG = 0.10000000E 01 GLOAD = 0.338337912E 01 FLY = 0.11790745E 05 VA = 0.33741821E 05

Y1 = 0.13502300E 08 ROLL = 0. ACC = 0.97838580E 02 RTGN = -0.68607707E 02 FPAA = -0.29706555E 01

Z1 = 0.66133917E 07 RLDOT = 0. DRAG = 0.29476862E 05 RTGL = 0.73553528E 03 PSAV = 0.10034265E 03

1 AUG. 1969 22 HR 18 MIN 14.61 SEC TMST 630770.3203 J.D. 244 435.4293 7 DAY 7 HR 12.8 MIN

X = -0.11267684E 08 XD = -0.28399709E 05 ALT = 0.20650650E 06 LAT = 0.22183953E 02 VI = 0.34570578E 05

Y = 0.16009292E 08 YD = -0.18749398E 05 R = 0.21122315E 08 LONG = 0.20023548E 03 FPAI = -0.22594539E 01

Z = 0.79295579E 07 LD = -0.6131476E 04 RDOT = -0.13632497E 04 FLP = 0. PSIV = 0.10010661E 03

X1 = -0.14558630E 08 TAG = 0.10000000E 01 GLOAD = 0.43876248E 01 FLY = 0.15264454E 05 VA = 0.33175208E 05

Y1 = 0.13497993E 08 ROLL = 0. ACC = 0.12888954E 03 RTGN = -0.68892198E 02 FPAA = -0.23558842E 01

Z1 = 0.66133917E 07 RLDOT = 0. DRAG = 0.38161136E 05 RTGL = 0.70830783E 03 PSAV = 0.10053963E 03

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1 AUG. 1969 22 HR 18 MIN 19.73 SEC TMST 630775.4453 J.D. 244 435.4293 7 DAY 7 HR 12.9 MIN

X = -0.11411932E 08 XD = -0.27878541E 05 ALT = 0.20055775E 06 LAT = 0.22099344E 02 VI = 0.33655409E 05

Y = 0.15914905E 08 YD = -0.18263799E 05 R = 0.21116438E 08 LONG = 0.200017898E 03 FPAI = -0.15646068E 01

Z = 0.78985797E 07 LD = -0.59505702E 04 RDOT = -0.92439303E 03 FLP = 0. PSIV = 0.10028683E 03

X1 = -0.14563674E 08 TAG = 0.20000000E 01 GLOAD = 0.52264340E 01 FLY = 0.18147651E 05 VA = 0.32451055E 05

Y1 = 0.13492551E 08 ROLL = 0. ACC = 0.152529619E 03 RTGN = -0.68198841E 02 FPAA = -0.16322931E 01

Z1 = 0.66133917E 07 RLDOT = 0. DRAG = 0.45369127E 05 RTGL = 0.68091422E 03 PSAV = 0.10073726E 03

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REFERENCE TRAJECTORY CALCULATION BEGAN AT 0.73624998E 02SECONDS

W_I IS NEGATIVE NO REFERENCE TRAJECTORY REQUIRED

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MOURE BUSINESS FORMS, INC.

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1 AUG. 1969 22 HR 18 MIN 24.73 SEC TMST 630780.4453 J.D. 244 435.4294 7 DAY 7 HR 13.0 MIN
X = -0.11549915E 08 XD = -0.27305296E 05 ALT = 0.19698275E 06 LAT = 0.22017268E 02 VI = 0.33050413E 05
Y = 0.15824942E 08 YD = -0.17718545E 05 R = 0.21112933E 08 LONG = 0.20117925E 03 FPAI = -0.82873929E 00
Z = 0.78693470E 07 ZD = -0.57274564E 04 RDOT = -0.47803207E 03 FLP = 0.59134338E 04 PSIV = 0.10462574E 03
XL = -0.16568592E 08 TAG = 0.30000000E 01 GLOAD = 0.569993035E 01 FLY = 0.18860513E 05 VA = 0.31646569E 05
YL = 0.13487240E 08 ROLL = 0.17416666E 02 ACC = 0.17094530E 03 RTGN = -0.68370202E 02 FPAA = -0.86550363E 00
ZL = 0.66133917E 07 RLDT = 0.16500000E 02 DRAG = 0.49390841E 05 RTGL = 0.65476214E 03 PSAV = 0.10089386E 03

1 AUG. 1969 22 HR 18 MIN 29.73 SEC TMST 630785.4453 J.D. 244 435.4294 7 DAY 7 HR 13.0 MIN
X = -0.11684741E 08 XD = -0.26584356E 05 ALT = 0.19531850E 06 LAT = 0.21937676E 02 VI = 0.32211021E 05
Y = 0.1573733E 08 YD = -0.17308458E 05 R = 0.21111336E 08 LONG = 0.20162778E 03 FPAI = -0.40890379E-00
Z = 0.78416626E 07 ZD = -0.53351177E 04 RDOT = -0.22987900E 03 FLP = 0.19918059E 05 PSIV = 0.10011024E 03
XL = -0.14573509E 08 TAG = 0.30000000E 01 GLOAD = 0.57519256E 01 FLY = 0.10155761E 03 VA = 0.30804952E 05
YL = 0.13481928E 08 ROLL = 0.89707875E 02 ACC = 0.18427441E 03 RTGN = -0.73520862E 02 FPAA = -0.62756728E-00
ZL = 0.66133917E 07 RLDT = 0. DRAG = 0.49797795E 05 RTGL = 0.628872895E 03 PSAV = 0.10057693E 03

19 AUG. 1969 22 HR 18 MIN 34.73 SEC TMST 630790.4453 J.D. 244 435.4295 7 DAY 7 HR 13.1 MIN
X = -0.1181543E 08 XD = -0.25775598E 05 ALT = 0.19431925E 06 LAT = 0.21863222E 02 VI = 0.31376461E 05
Y = 0.15650087E 08 YD = -0.17193163E 05 R = 0.21110399E 08 LONG = 0.20206453E 03 FPAI = -0.27828496E-00
Z = 0.78159621E 07 ZD = -0.49493463E 04 RDOT = -0.15239452E 03 FLP = 0.19558405E 05 PSIV = 0.99664253E 02
XL = -0.14578423E 08 TAG = 0.30000000E 01 GLOAD = 0.56589265E 01 FLY = -0.11170177E 04 VA = 0.29967736E 05
YL = 0.1347613E 08 ROLL = 0.93268729E 02 ACC = 0.18218303E 03 RTGN = -0.79823885E 02 FPAA = -0.29136562E-00
ZL = 0.66133917E 07 RLDT = 0. DRAG = 0.48975692E 05 RTGL = 0.60316510E 03 PSAV = 0.10012324E 03

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1 AUG.	1969	22	HR	18 MIN	39.73 SEC	TNST	630795.4453	J.D. 244 435.4295	7 DAY 7 HR 13.2 MIN
X	= -0.11942496E 08	XD	= -0.24959594E 05	ALT	= 0.19360505E 06	LAT	= 0.21793952E 02	V1	= 0.30560981E 05
Y	= 0.15565370E 08	YD	= -0.17024467E 05	R	= 0.21109739E 08	LONG	= 0.20248979E 03	FPAI	= -0.24476751E-00
Z	= 0.77921192E 07	ZD	= -0.45999712E 04	RDOT	= -0.13055608E 03	FLP	= 0.17320659E 05	PSIV	= 0.99221981E 02
XL	= -0.14583316E 08	TAG	= 0.30000000E 01	GLOAD	= 0.549998738E 01	FLY	= -0.79030289E 04	VA	= 0.29149749E 05
YL	= 0.13471297E 08	ROLL	= 0.11452615E 03	ACC	= 0.18109698E 03	RIGN	= -0.85786386E 02	FPAA	= -0.25661704E-00
ZL	= 0.66133917E 07	RLDOT	= 0.16500000E 02	DRAG	= 0.47596160E 05	RTGL	= 0.57822216E 03	PSAV	= 0.99672644E 02

1 AUG.	1969	22	HR	18 MIN	44.73 SEC	TNST	630800.4453	J.D. 244 435.4296	7 DAY 7 HR 13.3 MIN
X	= -0.12065054E 08	XD	= -0.24058348E 05	ALT	= 0.19244750E 06	LAT	= 0.21728631E 02	V1	= 0.29764111E 05
Y	= 0.15480465E 08	YD	= -0.16923080E 05	R	= 0.21108640E 08	LONG	= 0.20290364E 03	FPAI	= -0.64452567E 00
Z	= 0.77694521E 07	ZD	= -0.45505573E 04	RDOT	= -0.334681225E 03	FLP	= -0.98867123E 04	PSIV	= 0.99206197E 02
XL	= -0.16588247E 08	TAG	= 0.30000000E 01	GLOAD	= 0.54184401E 01	FLY	= -0.15960466E 05	VA	= 0.28332358E 05
YL	= 0.13465979E 08	ROLL	= -0.14822385E 03	ACC	= 0.18371960E 03	RIGN	= -0.87290998E 02	FPAA	= -0.67661900E 00
ZL	= 0.66133917E 07	RLDOT	= 0.20000000E 02	DRAG	= 0.46936365E 05	RTGL	= 0.55453930E 03	PSAV	= 0.99668959E 02

19	AUG.	1969	22	HR	18 MIN	49.73 SEC	TNST	630805.4453	J.D. 244 435.4297	7 DAY 7 HR 13.4 MIN
17	X	= -0.12183355E 08	XD	= -0.23289762E 05	ALT	= 0.19050275E 06	LAT	= 0.21662284E 02	V1	= 0.28962066E 05
16	Y	= 0.15396694E 08	YD	= -0.16540209E 05	R	= 0.21106751E 08	LONG	= 0.20330532E 03	FPAI	= -0.74165010E 00
14	Z	= 0.77461372E 07	ZD	= -0.47759562E 04	RDOT	= -0.37468136E 03	FLP	= -0.19087243E 05	PSIV	= 0.99911682E 02
11	XL	= -0.14593156E 08	TAG	= 0.30000000E 01	GLOAD	= 0.55062336E 01	FLY	= -0.28680077E 02	VA	= 0.27552294E 05
10	YL	= 0.13460659E 08	ROLL	= -0.90086094E 02	ACC	= 0.17673640E 03	RIGN	= -0.81810839E 02	FPAA	= -0.77958071E 00
7	ZL	= 0.66133917E 07	RLDOT	= 0.47718162E 05	DRAG	= 0.53257359E 03	RTGL	= 0.10042736E 03	PSAV	= 0.10042736E 03

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ACURE BUSINESS FORMS INC.

FORM 1413 REV. 7-24-64

X	-0.12298004E 08	XD	= -0.222569036E 05	ALT	= 0.18868325E 06	LAT	= 0.21592613E 02	VI	= 0.28148579E 05
Y	= 0.15315175E 08	YD	= -0.16066209E 05	R	= 0.21104990E 08	LONG	= 0.20369426E 03	FPAI	= -0.67530507E 00
Z	= 0.77217285E 07	ZD	= -0.49857862E 04	RDOT	= -0.33175983E 03	FLP	= -0.19213119E 05	PSIV	= 0.10070190E 03
X1	= -0.14598063E 08	TAG	= 0.30000000E 01	GLOAD	= 0.55438375E 01	FLY	= -0.14503461E 03	VA	= 0.26742624E 05
Y1	= 0.13455337E 08	ROLL	= -0.90432503E 02	ACC	= 0.17793642E 03	RTGN	= -0.75755171E 02	FPAA	= -0.71080924E 00
Z1	= 0.66133917E 07	RDOT	= 0.31722028E 01	DRAG	= 0.48034166E 05	RTGL	= 0.51132133E 03	PSAV	= 0.10127101E 03
X	-0.12409063E 08	XD	= -0.21055117E 05	ALT	= 0.16708500E 06	LAT	= 0.21519770E 02	VI	= 0.27333627E 05
Y	= 0.15236063E 08	YD	= -0.15577885E 05	R	= 0.21103452E 08	LONG	= 0.20407030E 03	FPAI	= -0.59547979E 00
Z	= 0.76963130E 07	ZD	= -0.51778917E 04	RDOT	= -0.28407554E 03	FLP	= -0.19148269E 05	PSIV	= 0.10150100E 03
X1	= -0.14602968E 08	TAG	= 0.30000000E 01	GLOAD	= 0.55312891E 01	FLY	= 0.91630758E 03	VA	= 0.25931152E 05
Y1	= 0.13650014E 08	ROLL	= -0.87260300E 02	ACC	= 0.17697167E 03	RTGN	= -0.69767751E 02	FPAA	= -0.62768584E 00
Z1	= 0.66133917E 07	RDOT	= 0.47925452E 05	DRAG	= 0.49068388E 03	RTGL	= 0.49068388E 03	PSAV	= 0.10213232E 03
X	-0.12516558E 08	XD	= -0.21143754E 05	ALT	= 0.18570000E 05	LAT	= 0.21444009E 02	VI	= 0.26523228E 05
Y	= 0.15159394E 08	YD	= -0.15090661E 05	R	= 0.21102130E 08	LONG	= 0.20443344E 03	FPAI	= -0.53282732E 00
Z	= 0.76899707E 07	ZD	= -0.53567919E 04	RDOT	= -0.24665162E 03	FLP	= -0.18926041E 05	PSIV	= 0.10230845E 03
X1	= -0.14607870E 08	TAG	= 0.30000000E 01	GLOAD	= 0.54678431E 01	FLY	= 0.90567323E 03	VA	= 0.25124553E 05
Y1	= 0.13644668E 08	ROLL	= -0.87260300E 02	ACC	= 0.17505242E 03	RTGN	= -0.63883751E 02	FPAA	= -0.56248912E 00
Z1	= 0.66133917E 07	RDOT	= 0.47369246E 05	DRAG	= 0.47369246E 05	RTGL	= 0.4706534E 03	PSAV	= 0.10300560E 03

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1 AUG.	1969	22	HR	19 MIN	9.73 SEC	TNST	630825.4453	J.D. 244 435.4299	7 DAY	7 HR 13.7 MIN
X	= -0.12620507E 08	XD	= -0.20434944E 05	ALT	= 0.18446000E 06	LAT	= 0.21365592E 02	V1	= 0.25725510E 05	
Y	= 0.15085134E 08	YD	= -0.14618005E 05	R	= 0.21100555E 08	LONG	= 0.20478379E 03	FPA1	= -0.51127636E 00	
Z	= 0.76427637E 07	ZD	= -0.55252921E 04	ROOT	= -0.22955740E 03	FLP	= -0.18567959E 05	PSIV	= 0.10311052E 03	
XL	= -0.14612771E 08	TAG	= 0.30000000E 01	GLOAD	= 0.53586095E 01	FLY	= -0.15103199E 03	VA	= 0.24330947E 05	
YL	= 0.13639362E 08	ROLL	= -0.90466038E 02	ACC	= 0.17233331E 03	RTGN	= -0.58151731E 02	FPAA	= -0.54058044E 00	
ZL	= 0.66133917E 07	RDDOT	= 0.	DRAG	= 0.46421434E 05	RTGL	= 0.45121539E 03	PSAV	= 0.10388513E 03	

1 AUG.	1969	22	HR	19 MIN	14.73 SEC	TNST	630830.4453	J.D. 244 435.4300	7 DAY	7 HR 13.8 MIN
X	= -0.12720913E 08	XD	= -0.19726526E 05	ALT	= 0.18323425E 06	LAT	= 0.21284780E 02	V1	= 0.24944034E 05	
Y	= 0.15013140E 08	YD	= -0.14168347E 02	R	= 0.21099795E 08	LONG	= 0.20512157E 03	FPA1	= -0.55168205E 00	
Z	= 0.76147340E 07	ZD	= -0.56856796E 04	ROOT	= -0.24017412E 03	FLP	= -0.18168513E 05	PSIV	= 0.10392750E 03	
XL	= -0.14617671E 08	TAG	= 0.30000000E 01	GLOAD	= 0.52537799E 01	FLY	= -0.12244047E 04	VA	= 0.23553090E 05	
YL	= 0.13634033E 08	ROLL	= -0.93855427E 02	ACC	= 0.16975201E 03	RTGN	= -0.525999634E 02	FPAA	= -0.58424243E 00	
ZL	= 0.66133917E 07	RDDOT	= 0.	DRAG	= 0.45524309E 05	RTGL	= 0.43235456E 03	PSAV	= 0.10476773E 03	

EQUILIBRIUM GLIDE PHASE BEGAN AT 0.12862500E 03 SECONDS WITH VELOCITY = 0.244801654E 05 AND RDOT = -0.2557937E 03

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1 AUG.	1969	22	HR	19 MIN	19.73 SEC	TNST	630835.4453	J.D. 244 435.4300	7 DAY	7 HR 13.9 MIN
X	= -0.12817771E 08	XD	= -0.19017155E 05	ALT	= 0.18189275E 06	LAT	= 0.21201841E 02	V1	= 0.24175876E 05	
Y	= 0.14943426E 08	YD	= -0.13738639E 05	R	= 0.21096522E 08	LONG	= 0.20544699E 03	FPA1	= -0.65420064E 00	
Z	= 0.75859251E 07	ZD	= -0.58370016E 04	ROOT	= -0.27603306E 03	FLP	= -0.17704953E 05	PSIV	= 0.10473562E 03	
XL	= -0.14622568E 08	TAG	= 0.60000000E 01	GLOAD	= 0.51686710E 01	FLY	= -0.27584107E 04	VA	= 0.22790474E 05	
YL	= 0.13628702E 08	ROLL	= -0.98855423E 02	ACC	= 0.16806845E 03	RTGN	= -0.47222230E 02	FPAA	= -0.59396941E 00	

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ZL = 0.66133917E 07 RLDOT = 0. DRAG = 0.44796359E 05 RTGL = 0.41406000E 03 PSAV = 0.10565377E 03

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MILLER BUSINESS FORMS, INC.

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1 AUG.	1969	22	HR	19 MIN	24.86 SEC	TMST	630840.5703	J.D. 244 435.4301	7 DAY	7 HR	14.0 MIN
X	= -0.12913374E 08	XD	= -0.18293548E 05	ALT	= 0.18026650E 06	LAT	= 0.21114907E 02	V1	= 0.23399460E 05		
Y	= 0.14874108E 08	YD	= -0.13308767E 05	R	= 0.21096965E 08	LONG	= 0.20576791E 03	FPA1	= -0.80152440E 00		
Z	= 0.75556349E 07	ZD	= -0.59797606E 04	RDOT	= -0.32732998E 03	FLP	= -0.17648992E 05	PSIV	= 0.1056712E 03		
XL	= -0.14627585E 08	TAG	= 0.60000000E 01	GLOAD	= 0.51078972E 01	FLY	= -0.1495048E 04	VA	= 0.22019299E 05		
YL	= 0.13423237E 08	ROLL	= -0.94843449E 02	ACC	= 0.16532780E 03	RTGN	= -0.41860312E 02	FPAA	= -0.85176641E 00		
ZL	= 0.66133917E 07	RLDOT	= 0.36479255E 01	DRAG	= 0.44280602E 05	RTGL	= 0.39588982E 03	PSAV	= 0.10657032E 03		

1 AUG.	1969	22	HR	19 MIN	29.86 SEC	TMST	630845.5703	J.D. 244 435.4301	7 DAY	7 HR	14.0 MIN
X	= -0.13003129E 08	XD	= -0.17611977E 05	ALT	= 0.17848800E 06	LAT	= 0.21028429E 02	V1	= 0.22647366E 05		
Y	= 0.14808660E 08	YD	= -0.12866051E 05	R	= 0.21095259E 08	LONG	= 0.20606881E 03	FPA1	= -0.88842746E 00		
Z	= 0.75254361E 07	ZD	= -0.60959400E 04	RDOT	= -0.351115563E 03	FLP	= -0.17650103E 05	PSIV	= 0.13639382E 03		
XL	= -0.14632479E 08	TAG	= 0.60000000E 01	GLOAD	= 0.50911822E 01	FLY	= 0.59770027E 03	VA	= 0.21272756E 05		
YL	= 0.13417902E 08	ROLL	= -0.880660490E 02	ACC	= 0.16342109E 03	RTGN	= -0.36689905E 02	FPAA	= -0.94584032E 00		
ZL	= 0.66133917E 07	RLDOT	= 0.	DRAG	= 0.44150552E 05	RTGL	= 0.37873094E 03	PSAV	= 0.10748647E 03		

1 AUG.	1969	22	HR	19 MIN	34.86 SEC	TMST	630850.5703	J.D. 244 435.4302	7 DAY	7 HR	14.1 MIN
X	= -0.13089516E 08	XD	= -0.16946000E 05	ALT	= 0.17663175E 06	LAT	= 0.20940525E 02	V1	= 0.21897560E 05		
Y	= 0.14745460E 08	YD	= -0.12410157E 05	R	= 0.21093474E 08	LONG	= 0.20635773E 03	FPA1	= -0.93978962E 00		
Z	= 0.74947093E 07	ZD	= -0.61906572E 04	RDOT	= -0.35915693E 03	FLP	= -0.17479672E 05	PSIV	= 0.10723253E 03		
XL	= -0.14632370E 08	TAG	= 0.60000000E 01	GLOAD	= 0.50638211E 01	FLY	= 0.17425443E 04	VA	= 0.20528925E 05		
YL	= 0.13412566E 08	ROLL	= -0.84307011E 02	ACC	= 0.16180993E 03	RTGN	= -0.31605487E 02	FPAA	= -0.10024481E 01		
ZL	= 0.66133917E 07	RLDOT	= 0.	DRAG	= 0.43915785E 05	RTGL	= 0.36212534E 03	PSAV	= 0.10842160E 03		

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MOORE BUSINESS FORMS, INC.

FORM 1412 PRINTED IN U.S.A.

1 AUG. 1969 22 HR 19 MIN 39.86 SEC TMST 630855.5703 J.D. 244 435.4302 7 DAY 7 HR 14.2 MIN

X = -0.13172616E 08 XD = -0.16296541E 05 ALT = 0.17477400E 06 LAT = 0.20851443E 02 VI = 0.21152149E 05

Y = 0.14684575E 08 YD = -0.11942029E 05 R = 0.21091689E 08 LONG = 0.20663474E 03 FPAI = -0.95546320E 00

Z = 0.74635600E 07 ZD = -0.62629180E 04 RDOT = -0.35271645E 03 FLP = -0.17244975E 05 PSIV = 0.10807769E 03

X1 = -0.14642259E 08 TAG = 0.60000000E 01 GLOAD = 0.50335919E 01 FLY = 0.27663896E 04 VA = 0.19789882E 05

Y1 = 0.13407229E 08 ROLL = -0.80892902E 02 ACC = 0.16019847E 03 RTGN = -0.26644333E 02 FPAA = -0.10212368E 01

Z1 = 0.66133917E 07 RLDDOT = 0.31917883E 01 DRAG = 0.43662844E 05 RTGL = 0.34606536E 03 PSAV = 0.10937037E 03

1 AUG. 1969 22 HR 19 MIN 44.86 SEC TMST 630860.5703 J.D. 244 435.4303 7 DAY 7 HR 14.3 MIN

X = -0.13252510E 08 XD = -0.15663858E 05 ALT = 0.17298450E 06 LAT = 0.20761443E 02 VI = 0.20412065E 05

Y = 0.14626055E 08 YD = -0.11465446E 05 R = 0.21089972E 08 LONG = 0.20689993E 03 FPAI = -0.93420364E 00

Z = 0.74321203E 07 ZD = -0.63118539E 04 RDOT = -0.33283103E 03 FLP = -0.16633592E 05 PSIV = 0.10892447E 03

X1 = -0.14647147E 08 TAG = 0.60000000E 01 GLOAD = 0.49747424E 01 FLY = 0.46060114E 04 VA = 0.19056525E 05

Y1 = 0.13401889E 08 ROLL = -0.74522049E 02 ACC = 0.15720650E 03 RTGN = -0.21834645E 02 FPAA = -0.10007465E 01

Z1 = 0.66133917E 07 RLDDOT = 0.31917883E 01 DRAG = 0.43148852E 05 RTGL = 0.33054480E 03 PSAV = 0.11032826E 03

1 AUG. 1969 22 HR 19 MIN 49.86 SEC TMST 630865.5703 J.D. 244 435.4304 7 DAY 7 HR 14.4 MIN

X = -0.13329287E 08 XD = -0.15049015E 05 ALT = 0.17131675E 06 LAT = 0.20670802E 02 VI = 0.19682935E 05

Y = 0.14569921E 08 YD = -0.10989002E 05 R = 0.21088377E 08 LONG = 0.20715349E 03 FPAI = -0.88765308E 00

Z = 0.74004850E 07 ZD = -0.63393130E 04 RDOT = -0.30492505E 03 FLP = -0.16034237E 05 PSIV = 0.10976606E 03

X1 = -0.14652032E 08 TAG = 0.60000000E 01 GLOAD = 0.48931438E 01 FLY = 0.55874307E 04 VA = 0.18334430E 05

Y1 = 0.13396548E 08 ROLL = -0.707880151E 02 ACC = 0.15400165E 03 RTGN = -0.17211803E 02 FPAA = -0.95294457E 00

Z1 = 0.66133917E 07 RLDDOT = 0.31917883E 01 DRAG = 0.42449687E 05 RTGL = 0.31555549E 03 PSAV = 0.11128827E 03

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1	AUG.	1969	22	HR	19 MIN	54.86 SEC	TMSI	630870.5703	J.D.	244 435.4304	7 DAY	7 HR 14.5 MIN
X	= -0.13403036E 08	XD	= -0.14453016E 05	ALT	= 0.16981025E 06	LAT	= 0.20579799E 02	VI	= 0.18965546E 05			
Y	= 0.14516167E 08	YD	= -0.10514209E 05	R	= 0.21086944E 08	LONG	= 0.20739561E 03	FPAI	= -0.81142902E 00			
Z	= 0.73687682E 07	ZD	= -0.63445798E 04	RDDT	= -0.26858314E 03	FLP	= -0.15327400E 05	PSIV	= 0.11059713E 03			
XL	= -0.14656915E 08	TAG	= 0.60000000E 01	GLOAD	= 0.47930415E 01	FLY	= 0.64517435E 04	VA	= 0.17624335E 05			
YL	= 0.13391205E 08	ROLL	= -0.67172379E 02	ACC	= 0.15025584E 03	RTGN	= -0.12798009E 02	FPAA	= -0.87318248E 00			
ZL	= 0.66133917E 07	RDDT	= 0.	DRAG	= 0.41574796E 05	RTGL	= 0.30108921E 03	PSAV	= 0.11224528E 03			
1	AUG.	1969	22	HR	19 MIN	59.86 SEC	TMSI	630875.5703	J.D.	244 435.4305	7 DAY	7 HR 14.5 MIN
X	= -0.13473859E 08	XD	= -0.13879499E 05	ALT	= 0.16850100E 06	LAT	= 0.20488712E 02	VI	= 0.18266428E 05			
Y	= 0.144664767E 08	YD	= -0.10048265E 05	R	= 0.21085708E 08	LONG	= 0.20762660E 03	FPAI	= -0.70970532E 00			
Z	= 0.73370784E 07	ZD	= -0.63288436E 04	RDDT	= -0.22625487E 03	FLP	= -0.14429047E 05	PSIV	= 0.11140759E 03			
XL	= -0.14661797E 08	TAG	= 0.60000000E 01	GLOAD	= 0.464421000E 01	FLY	= 0.71517061E 04	VA	= 0.16932662E 05			
YL	= 0.13385860E 08	ROLL	= -0.63634850E 02	ACC	= 0.14498021E 03	RTGN	= -0.86361281E 01	FPAA	= -0.76561041E 00			
ZL	= 0.66133917E 07	RDDT	= 0.	DRAG	= 0.40260427E 05	RTGL	= 0.28713617E 03	PSAV	= 0.11318839E 03			

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MOORE BUSINESS FORMS, INC.

FORM 1413 EDITION 22

1 AUG. 1969 22 HR 20 MIN 9.86 SEC TMSI 630895.5703 J.D. 244 435.4306 7 DAY 7 HR 14.7 MIN
 X = -0.13607223E 08 XD = -0.12810272E 05 ALT = 0.16655925E 06 LAT = 0.20307359E 02 VI = 0.16944243E 05
 Y = 0.14368758E 08 YD = -0.91671411E 04 R = 0.21083910E 08 LONG = 0.20805683E 03 FPAI = -0.45175554E-00
 Z = 0.72741701E 07 ZD = -0.62424212E 04 RDOT = -0.13359756E 03 FLP = -0.12372186E 05 PSIV = 0.11293111E 03
 XL = -0.14671554E 08 TAG = 0.60000000E 01 GLOAD = 0.42616773E 01 FLY = 0.80883852E 04 VA = 0.15625385E 05
 YL = 0.1375165E 08 ROLL = -0.56825127E 02 ACC = 0.13215215E 03 RIGN = -0.11854243E 01 FPAA = -0.48988592E-00
 ZL = 0.66133917E 07 DRAG = 0.36953770E 05 RTGL = 0.26071680E 03 PSAV = 0.11499332E 03

1 AUG. 1969 22 HR 20 MIN 14.86 SEC TMSI 630890.5703 J.D. 244 435.4306 7 DAY 7 HR 14.8 MIN
 X = -0.13670031E 08 XD = -0.12317300E 05 ALT = 0.16593775E 06 LAT = 0.20217571E 02 VI = 0.16320657E 05
 Y = 0.14323950E 08 YD = -0.87610143E 04 R = 0.21083359E 08 LONG = 0.20825706E 03 FPAI = -0.30863063E-00
 Z = 0.72431186E 07 ZD = -0.61768743E 04 RDOT = -0.87955853E 02 FLP = -0.11251047E 05 PSIV = 0.11363045E 03
 XL = -0.14676430E 08 TAG = 0.60000000E 01 GLOAD = 0.40313128E 01 FLY = 0.82988470E 04 VA = 0.15017052E 05
 YL = 0.13369814E 08 ROLL = -0.53581269E 02 ACC = 0.12458791E 03 RIGN = 0.20765307E 01 FPAA = -0.33558426E-00
 ZL = 0.66133917E 07 RLDOT = 0. DRAG = 0.34951478E 05 RTGL = 0.24822047E 03 PSAV = 0.11583917E 03

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 17 1 AUG. 1969 22 HR 20 MIN 19.86 SEC TMSI 630895.5703 J.D. 244 435.4307 7 DAY 7 HR 14.9 MIN
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 15 X = -0.13730447E 08 XD = -0.11853531E 05 ALT = 0.16553675E 06 LAT = 0.20128646E 02 VI = 0.15748083E 05
 14 Y = 0.14281102E 08 YD = -0.83832130E 04 R = 0.21083028E 08 LONG = 0.20844814E 03 FPAI = -0.16698702E-00
 13
 12 Z = 0.72124230E 07 ZD = -0.61006283E 04 RDOT = -0.45897370E 02 FLP = -0.10132986E 05 PSIV = 0.11428044E 03
 11
 10 XL = -0.14681304E 08 TAG = 0.60000000E 01 GLOAD = 0.37860769E 01 FLY = 0.83475117E 04 VA = 0.14443459E 05
 9 YL = 0.13364462E 08 ROLL = -0.50518448E 02 ACC = 0.11663996E 03 RIGN = 0.50227862E 01 FPAA = -0.18206894E-00
 8
 7 ZL = 0.66133917E 07 RLDOT = 0. DRAG = 0.32821332E 05 RTGL = 0.23617569E 03 PSAV = 0.1163762E 03
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1 AUG.	1969	22	HR	20 MIN	24.86 SEC	TMSI	630900.5703	J.D.	244 435.4308	7 DAY	7 HR 15.0 MIN		
X	= -0.13788617E 08	XD	= -0.11417998E 05	ALT	= 0.16533400E 06	R	= -0.80359246E 04	RDOT	= -0.21082895E 08	LONG	= 0.20863066E 03	FPAI	= -0.38306262E-01
Y	= 0.14240068E 08	YD	= -0.11417998E 05	TAG	= -0.60177832E 04	R	= -0.10164919E 02	FLP	= -0.94810518E 04	PSIV	= 0.11480146E 03		
Z	= 0.71821281E 07	TD	= -0.60177832E 04	GLOAD	= 0.35363455E 01	ACC	= 0.10905809E 02	FLY	= 0.77749171E 04	VA	= 0.13906001E 05		
XL	= -0.14636175E 08	ROLL	= -0.50646606E 02	RTGN	= 0.76767235E 01	DRAG	= 0.30653271E 05	RTGL	= 0.22456158E 03	PSAV	= 0.11738799E 03		
YL	= 0.13359109E 08	TD	= -0.34262073E 01	RDOT	= 0.66133917E 07	ACC	= 0.13532902E 02	FLP	= 0.35613995E 02	PSIV	= 0.20860528E 03		
ZL	= 0.66133917E 07	ROLL	= 0.20000000E 02	GLOAD	= 0.60000000E 01	FLY	= 0.32894737E 01	FLY	= 0.11087159E 05	VA	= 0.13404671E 05		

1 AUG.	1969	22	HR	20 MIN	29.86 SEC	TMSI	630905.5703	J.D.	244 435.4308	7 DAY	7 HR 15.0 MIN		
X	= -0.13844691E 08	XD	= -0.11024048E 05	ALT	= 0.16530875E 06	R	= -0.71200717E 04	RDOT	= 0.21082937E 08	LONG	= 0.19953993E 02	FPAI	= 0.14697382E 05
Y	= 0.14200693E 08	YD	= -0.715221798E 07	TD	= -0.59062595E 04	FLP	= 0.35613995E 02	FLP	= -0.266805257E 04	PSIV	= 0.13883640E-00		
Z	= 0.715221798E 07	ROLL	= -0.13532902E 02	GLOAD	= 0.97612864E 02	ACC	= 0.97612864E 02	RTGN	= 0.97267078E 01	FPAA	= 0.15222699E-00		
XL	= -0.146391045E 08	TD	= 0.20000000E 02	RDOT	= 0.71233017E 07	DRAG	= 0.28509443E 05	RTGL	= 0.21337073E 03	PSAV	= 0.11799200E 03		
YL	= 0.133591175E 08	ROLL	= 0.20000000E 02	FLP	= 0.98548861E 02	FLP	= 0.43094952E 04	PSIV	= 0.11511277E 03				
ZL	= 0.66133917E 07	RDOT	= 0.60000000E 01	GLOAD	= 0.30335911E 01	ACC	= 0.90704125E 02	RTGN	= 0.91664103E 01	FPAA	= 0.43637737E-00		
21	= 0.66133917E 07	RDDN	= 0.	DRAG	= 0.26285682E 05	RTGL	= 0.20268396E 03	PSAV	= 0.11783313E 03				

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MICRO BUSINESS FORMS, INC.

POLYGRAPHIC SYSTEMS

1 AUG. 1969 22 HR 20 MIN 39.86 SEC TMST 630915.5703 J.D. 244 435.4309 7 DAY 7 HR 15.2 MIN
 X = -0.13951658E 08 XD = -0.10380796E 05 ALT = 0.16613150E 06 LAT = 0.19788693E 02 VI = 0.13810838E 05
 Y = 0.14125593E 08 YD = -0.13291723E 04 R = 0.21083888E 08 LONG = 0.20913582E 03 FPAI = 0.57393396E 00
 Z = 0.70957169E 07 ZD = -0.54093953E 04 RDOT = 0.13834136E 03 FLP = 0.39485272E 04 PSIV = 0.11480567E 03
 XL = -0.14700779E 08 TAG = 0.60000000E 01 GLOAD = 0.27799942E 01 FLY = 0.87872125E 04 VA = 0.12511465E 05
 YL = 0.13343037E 08 ROLL = 0.24196728E 02 ACC = 0.83260651E 02 RTGN = 0.84368738E 01 FPAA = 0.63354444E 00
 ZL = 0.66133917E 07 RLDOT = 0. DRAG = 0.24083964E 05 RTGL = 0.19236999E 03 PSAV = 0.11758851E 03

1 AUG. 1969 22 HR 20 MIN 44.86 SEC TMST 630920.5703 J.D. 244 435.4310 7 DAY 7 HR 15.3 MIN
 X = -0.14002815E 08 XD = -0.10084815E 05 ALT = 0.16682750E 06 LAT = 0.19711319E 02 VI = 0.13422216E 05
 Y = 0.14089340E 08 YD = -0.71751117E 04 R = 0.21086444E 08 LONG = 0.20929339E 03 FPAI = 0.69052871E 00
 Z = 0.70692222E 07 ZD = -0.51932803E 04 RDOT = 0.16176062E 03 FLP = 0.31453542E 04 PSIV = 0.11451975E 03
 XL = -0.14705643E 08 TAG = 0.60000000E 01 GLOAD = 0.25397835E 01 FLY = 0.82189276E 04 VA = 0.12119347E 05
 YL = 0.13337676E 08 ROLL = 0.20941666E 02 ACC = 0.76031384E 02 RTGN = 0.78212162E 01 FPAA = 0.76476944E 00
 ZL = 0.66133917E 07 RLDOT = 0. DRAG = 0.220000572E 05 RTGL = 0.18238382E 03 PSAV = 0.11736317E 03

1 AUG. 1969 22 HR 20 MIN 49.86 SEC TMST 630925.5703 J.D. 244 435.4311 7 DAY 7 HR 15.4 MIN
 X = -0.14052536E 08 XD = -0.98061429E 04 ALT = 0.16761275E 06 LAT = 0.19636617E 02 VI = 0.13066711E 05
 Y = 0.14053819E 08 YD = -0.70369249E 04 R = 0.21085487E 08 LONG = 0.20944636E 03 FPAI = 0.75789486E 00
 Z = 0.70437334E 07 ZD = -0.50060170E 04 RDOT = 0.17283829E 03 FLP = 0.280883328E 04 PSIV = 0.11427937E 03
 XL = -0.14710505E 08 TAG = 0.60000000E 01 GLOAD = 0.23186642E 01 FLY = 0.74962438E 04 VA = 0.11769882E 05
 YL = 0.13332313E 08 ROLL = -0.21071869E 02 ACC = 0.69658147E 02 RTGN = 0.74057357E 01 FPAA = 0.84205218E 00
 ZL = 0.66133917E 07 RLDOT = 0. DRAG = 0.20083596E 05 RTGL = 0.17269505E 03 PSAV = 0.11718405E 03

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	1 AUG. 1969	22 HR 20 MIN 54.86 SEC TMSI	630930.5703 J.D. 244 435.4311	7 DAY 7 HR 15.5 MIN
X	= -0.14100902E 08	XD = -0.95424349E 04	ALT = 0.16842050E 06	LAT = 0.19564489E 02 VI = 0.12741571E 05
Y	= 0.14018938E 08	YD = -0.69182970E 04	R = 0.21086351E 08	LONG = 0.20959509E 03 FPAI = 0.76694230E 00
Z	= 0.70191263E 07	ZD = -0.48401185E 04	RDOT = 0.17054935E 03	FLP = 0.26472739E 04 PSIV = 0.11405439E 03
X1	= -0.14715365E 08	TAG = 0.60000000E 01	GLOAD = 0.21248789E 01	FLY = 0.68706108E 04 VA = 0.11432954E 05
Y1	= 0.13326949E 08	ROLL = 0.21071869E 02	ACC = 0.64166850E 02	RIGN = 0.70845498E 01 FPAA = 0.85473413E 00
Z1	= 0.66133917E 07	RDOT = 0.	DRAG = 0.18407429E 05	RIGL = 0.16328265E 03 PSAV = 0.11701784E 03

	1 AUG. 1969	22 HR 20 MIN 59.86 SEC TMSI	630935.5703 J.D. 244 435.4312	7 DAY 7 HR 15.5 MIN
X	= -0.14147982E 08	XD = -0.92917660E 04	ALT = 0.16919025E 06	LAT = 0.19494703E 02 VI = 0.12442524E 05
Y	= 0.13984608E 08	YD = -0.68162680E 04	R = 0.21087174E 08	LONG = 0.20973992E 03 FPAI = 0.72330191E 00
Z	= 0.69953021E 07	ZD = -0.46923319E 04	RDOT = 0.15708762E 03	FLP = 0.24405371E 04 PSIV = 0.11384284E 03
X1	= -0.14720223E 08	TAG = 0.60000000E 01	GLOAD = 0.19588685E 01	FLY = 0.633340558E 04 VA = 0.11131272E 05
Y1	= 0.13321582E 08	ROLL = 0.21071869E 02	ACC = 0.59532870E 02	RIGN = 0.68452498E 01 FPAA = 0.80860303E 00
Z1	= 0.66133917E 07	RDOT = 0.33306666E 01	DRAG = 0.16969915E 05	RIGL = 0.15412413E 03 PSAV = 0.11686283E 03

	1 AUG. 1969	22 HR 21 MIN 4.86 SEC TMSI	630940.5703 J.D. 244 435.4312	7 DAY 7 HR 15.6 MIN
X	= -0.14193836E 08	XD = -0.90516837E 04	ALT = 0.16986550E 06	LAT = 0.19427091E 02 VI = 0.12166525E 05
Y	= 0.13950742E 08	YD = -0.67328132E 04	R = 0.21087901E 08	LONG = 0.209880118E 03 FPAI = 0.62136365E 00
Z	= 0.69721857E 07	ZD = -0.45563793E 04	RDOT = 0.13194145E 03	FLP = 0.25997091E 04 PSIV = 0.11361821E 03
X1	= -0.14725079E 08	TAG = 0.60000000E 01	GLOAD = 0.18157248E 01	FLY = 0.57303516E 04 VA = 0.10852491E 05
Y1	= 0.13316215E 08	ROLL = 0.24402538E 02	ACC = 0.55865441E 02	RIGN = 0.66124618E 01 FPAA = 3.69660501E 00
Z1	= 0.66133917E 07	RDOT = 0.	DRAG = 0.15731222E 05	RIGL = 0.14520280E 03 PSAV = 0.11668961E 03

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FORM 1413 EDITION NO. 1-A

1 AUG. 1969 22 HR. 21 MIN 9.86 SEC TMST 630945.5703 J.D. 244 435.4313 7 DAY 7 HR 15.7 MIN

X = -0.14238514E 08 XD = -0.88207541E 04 ALT = 0.17039225E 06 LAT = 0.19361541E 02 VI = 0.11910285E 05

Y = 0.13917255E 08 YD = -0.666443871E 04 R = 0.21088477E 08 LONG = 0.21001913E 03 FPAI = 0.46743594E-00

Z = 0.69497203E 07 ZD = -0.44311534E 04 RDOT = 0.97166552E 02 FLP = 0.27169765E 04 PSIV = 0.11338565E 03

XL = -0.14729922E 08 TAG = 0.60000000E 01 GLOAD = 0.16955214E 01 FLY = 0.52111367E 04 VA = 0.10593396E 05

YL = 0.13310845E 08 ROLL = 0.27536579E 02 ACC = 0.528884031E 02 RTGN = 0.64012092E 01 FPAA = 0.52554805E 00

ZL = 0.66133917E 07 RLDOT = 0 DRAG = 0.14692240E 05 RTGL = 0.13650043E 03 PSAV = 0.11650422E 03

1 AUG. 1969 22 HR. 21 MIN 14.86 SEC TMST 630950.5703 J.D. 244 435.4313 7 DAY 7 HR 15.8 MIN

X = -0.14282056E 08 XD = -0.85971820E 04 ALT = 0.17072525E 06 LAT = 0.19297952E 02 VI = 0.11670645E 05

Y = 0.13864077E 08 YD = -0.66090198E 04 R = 0.210880859E 08 LONG = 0.21015404E 03 FPAI = 0.26447346E-00

Z = 0.69278597E 07 ZD = -0.43142198E 04 RDOT = 0.53870721E 02 FLP = 0.28170727E 04 PSIV = 0.11314101E 03

XL = -0.14724786E 08 TAG = 0.60000000E 01 GLOAD = 0.15977427E 01 FLY = 0.47688386E 04 VA = 0.10350802E 05

YL = 0.13305674E 08 ROLL = 0.30578533E 02 ACC = 0.50549154E 02 RTGN = 0.62021088E 01 FPAA = 0.29820093E-00

ZL = 0.66133917E 07 RLDOT = 0 DRAG = 0.13847885E 05 RTGL = 0.12800274E 03 PSAV = 0.11630235E 03

1 AUG. 1969 22 HR. 21 MIN 19.86 SEC TMST 630955.5703 J.D. 244 435.4314 7 DAY 7 HR 15.9 MIN

X = -0.14324496E 08 XD = -0.83792998E 04 ALT = 0.17082450E 06 LAT = 0.19236252E 02 VI = 0.11444514E 05

Y = 0.13851147E 08 YD = -0.65645629E 04 R = 0.21089005E 08 LONG = 0.21028611E 03 FPAI = 0.16520520E-01

Z = 0.69065669E 07 ZD = -0.42036589E 04 RDOT = 0.32998822E 01 FLP = 0.29414709E 04 PSIV = 0.11288272E 03

XL = -0.14729636E 08 TAG = 0.60000000E 01 GLOAD = 0.15214766E 01 FLY = 0.43801338E 04 VA = 0.10121618E 05

YL = 0.13300100E 08 ROLL = 0.318893259E 02 ACC = 0.48843535E 02 RTGN = 0.60136735E 01 FPAA = 0.18681421E-01

ZL = 0.66133917E 07 RLDOT = 0 DRAG = 0.13190391E 05 RTGL = 0.11969768E 03 PSAV = 0.11608272E 03

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1	AUG.	1969	22	HR	21	MIN	24.86	SEC	TNST	630960.5703	J.D.	244	435.4315	7	DAY	7	HR	16.0	MIN
X	=	-0.14365856E	08	XD	=	-0.81654663E	04	ALT	=	0.17065625E	06	LAT	=	0.19176392E	02	VI	=	0.11220953E	05
Y	=	0.13818418E	08	YD	=	-0.65287454E	04	R	=	0.21088882E	08	LONG	=	0.21041549E	03	FPAI	=	-0.27296168E	00
Z	=	0.68858151E	07	ZD	=	-0.40975635E	04	RDOT	=	-0.53495426E	02	FLP	=	0.30849416E	04	PSIV	=	0.11260829E	03
X1	=	-0.14744484E	08	TAG	=	0.60000000E	01	GLOAD	=	0.14655378E	01	FLY	=	0.40407343E	04	VA	=	0.99029047E	04
Y1	=	0.13294725E	08	ROLL	=	0.37360306E	02	ACC	=	0.47703835E	02	RTGN	=	0.58330321E	01	FPAAA	=	-0.30951087E	00
Z1	=	0.66133917E	07	RLDOT	=	0.	DRAG	=	0.12709346E	05	RIGL	=	0.11157565E	03	PSAV	=	0.11584303E	03	

1	AUG.	1969	22	HR	21	MIN	29.98	SEC	TNST	630962.6953	J.D.	244	435.4315	7	DAY	7	HR	16.0	MIN
X	=	-0.14407149E	08	XD	=	-0.79488758E	04	ALT	=	0.17017650E	06	LAT	=	0.19116915E	02	VI	=	0.11016088E	05
Y	=	0.13785037E	08	YD	=	-0.64989704E	04	R	=	0.21088447E	08	LONG	=	0.21054546E	03	FPAI	=	-0.60937922E	00
Z	=	0.68650871E	07	ZD	=	-0.39916119E	04	RDOT	=	-0.11716132E	03	FLP	=	0.322470836E	04	PSIV	=	0.11230754E	03
X1	=	-0.14749452E	08	TAG	=	0.60000000E	01	GLOAD	=	0.14277903E	01	FLY	=	0.37422536E	04	VA	=	0.96867024E	04
Y1	=	0.13289214E	08	ROLL	=	0.40947563E	02	ACC	=	0.47045933E	02	RTGN	=	0.56540315E	01	FPAAA	=	-3.69300977E	00
Z1	=	0.66133917E	07	RLDOT	=	0.30047231E	01	DRAG	=	0.12386488E	05	RIGL	=	0.10343317E	03	PSAV	=	0.11557408E	03

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MOORE BUSINESS FORMS, INC.

FORM 1410 PRINTED U.S.A.

1 AUG.	1969	22	HR	21 MIN	39.98 SEC	TMST	630975.6953	J.D.	244 435.4316	7 DAY	7 HR	16.2 MIN	
X	= -0.14484533E 08	XD	= -0.75279184E 04	ALT	= 0.16824700E 06	LAT	= 0.19006335E 02	VI	= 0.10616249E 05				
Y	= 0.13720280E 08	YD	= -0.64541420E 04	R	= 0.21086600E 08	LONG	= 0.21079169E 03	FPAI	= -0.13725034E 01				
Z	= 0.68261966E 07	ZD	= -0.37863940E 04	RDOT	= -0.25423688E 03	FLP	= 0.36057978E 04	PSIV	= 0.11165028E 03				
XL	= -0.14759139E 08	TAG	= 0.60000000E 01	GLOAD	= 0.14049649E 01	FLY	= 0.32866595E 04	VA	= 0.92780092E 04				
YL	= 0.13278455E 08	ROLL	= 0.47651043E 02	ACC	= 0.46992583E 02	RIGN	= 0.53130021E 01	FPAAA	= -0.15702186E 01				
ZL	= 0.66133917E 07	RLDOT	= 0.37454810E 01	DRAG	= 0.12197313E 05	RIGL	= 0.88060875E 02	PSAV	= 0.11496809E 03				
1 AUG.	1969	22	HR	21 MIN	44.98 SEC	TMST	630980.6953	J.D.	244 435.4317	7 DAY	7 HR	16.3 MIN	
X	= -0.14521642E 08	XD	= -0.73153842E 04	ALT	= 0.16675325E 06	LAT	= 0.18953797E 02	VI	= 0.10415087E 05				
Y	= 0.13688057E 08	YD	= -0.64348104E 04	R	= 0.21085146E 08	LONG	= 0.21091124E 03	FPAI	= -0.18030735E 01				
Z	= 0.68075261E 07	ZD	= -0.36813607E 04	RDOT	= -0.32770420E 03	FLP	= 0.38674710E 04	PSIV	= 0.11127906E 03				
XL	= -0.14763979E 08	TAG	= 0.60000000E 01	GLOAD	= 0.14243126E 01	FLY	= 0.30877456E 04	VA	= 0.90752363E 04				
YL	= 0.13273013E 08	ROLL	= 0.51396523E 02	ACC	= 0.47781622E 02	RIGN	= 0.51444103E 01	FPAAA	= -0.20693808E 01				
ZL	= 0.66133917E 07	RLDOT	= 0.37653193E 01	DRAG	= 0.12372223E 05	RIGL	= 0.80626910E 02	PSAV	= 0.11461732E 03				
19	1 AUG.	1969	22	HR	21 MIN	49.98 SEC	TMST	630985.6953	J.D.	244 435.4318	7 DAY	7 HR	16.4 MIN
20	X	= -0.145571679E 08	XD	= -0.70989064E 04	ALT	= 0.16498700E 06	LAT	= 0.18903157E 02	VI	= 0.10213315E 05			
21	Y	= 0.13655930E 08	YD	= -0.64154630E 04	R	= -0.21083317E 08	LONG	= 0.21102840E 03	FPAI	= -0.22668902E 01			
22	Z	= 0.67893907E 07	ZD	= -0.35719969E 04	RDOT	= -0.40398130E 03	FLP	= 0.43205000E 04	PSIV	= 0.11086961E 03			
23	XL	= -0.14768817E 08	TAG	= 0.60000000E 01	GLOAD	= 0.14587566E 01	FLY	= 0.26538312E 04	VA	= 0.88696812E 04			
24	YL	= 0.13261689E 08	ROLL	= 0.584440018E 02	ACC	= 0.49428472E 02	RIGN	= 0.49709986E 01	FPAAA	= -0.26105119E 01			
25	ZL	= 0.66133917E 07	RLDOT	= 0.	DRAG	= 0.12676144E 05	RIGL	= 0.73363079E 02	PSAV	= 0.11422451E 03			

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ACI-CPE BUSINESS FORMS, INC.

PRINTED IN U.S.A. Form - 1413

1	AUG.	1969	22	HR	21	MIN	54.98	SEC	TMST	630990.6953	J.D.	244	435.4318	7	DAY	7	HR	16.5	MIN
X	=	-0.14592622E	08	XD	=	-0.687772103E	04	ALT	=	0.16263525E	06	LAT	=	0.18854500E	02	V1	=	0.10006838E	05
Y	=	0.13623904E	08	YD	=	-0.63944947E	04	R	=	0.21081102E	08	LONG	=	0.21114316E	03	FPA1	=	-0.27638173E	01
Z	=	0.67718152E	07	ZD	=	-0.34570542E	04	RDOT	=	-0.48251977E	03	FLP	=	0.46170919E	04	PSIV	=	0.11041716E	03
XL	=	-0.14773654E	08	TAG	=	0.60000000E	01	GLOAD	=	0.15142302E	01	FLY	=	0.25337744E	04	VA	=	0.86592496E	04
YL	=	0.13262303E	08	ROLL	=	0.61242836E	02	ACC	=	0.51078872E	02	RTGN	=	0.47941002E	01	FPAA	=	-0.31943480E	01
ZL	=	0.66133917E	07	RLDOT	=	0.	DRAG	=	0.13166612E	05	RTGL	=	0.66273150E	02	PSAV	=	0.11378466E	03	

1	AUG.	1969	22	HR	21	MIN	59.98	SEC	TMST	630995.6953	J.D.	244	435.4319	7	DAY	7	HR	16.5	MIN
X	=	-0.14626440E	08	XD	=	-0.66484950E	04	ALT	=	0.15998975E	06	LAT	=	0.18807921E	02	V1	=	0.37923838E	04
Y	=	0.1359193E	08	YD	=	-0.63694579E	04	R	=	0.21078491E	08	LONG	=	0.21125543E	03	FPA1	=	-0.32920922E	01
Z	=	0.67548331E	07	ZD	=	-0.33344117E	04	RDOT	=	-0.56233976E	03	FLP	=	0.49722791E	04	PSIV	=	0.10991363E	03
XL	=	-0.14778489E	08	TAG	=	0.60000000E	01	GLOAD	=	0.15857214E	01	FLY	=	0.23909407E	04	VA	=	0.84406439E	04
YL	=	0.13256915E	08	ROLL	=	0.64319237E	02	ACC	=	0.53148179E	02	RTGN	=	0.46129460E	01	FPAA	=	-0.38200360E	01
ZL	=	0.66133917E	07	RLDOT	=	0.	DRAG	=	0.13793150E	05	RTGL	=	0.59363702E	02	PSAV	=	0.11320942E	03	

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1	AUG.	1969	22	HR	22	MIN	4.98	SEC	TMST	631000.6953	J.D.	244	435.4319	7	DAY	7	HR	16.6	MIN
X	=	-0.14659092E	08	XD	=	-0.64107823E	04	ALT	=	0.15694325E	06	LAT	=	0.18763549E	02	V1	=	0.95670605E	04
Y	=	0.13560220E	08	YD	=	-0.633884930E	04	R	=	0.21075477E	08	LONG	=	0.21136509E	03	FPA1	=	-0.38541852E	01
Z	=	0.67384870E	07	ZD	=	-0.32021905E	04	RDOT	=	-0.64307391E	03	FLP	=	0.54228153E	04	PSIV	=	0.10934892E	03
XL	=	-0.14783321E	08	TAG	=	0.60000000E	01	GLOAD	=	0.16866302E	01	FLY	=	0.22516799E	04	VA	=	0.82109454E	04
YL	=	0.13251526E	08	ROLL	=	0.67450626E	02	ACC	=	0.56034157E	02	RTGN	=	0.44269207E	01	FPAA	=	-0.44919541E	01
ZL	=	0.66133917E	07	RLDDT	=	0.31833394E	01	DRAG	=	0.14679277E	05	RTGL	=	0.52663499E	02	PSAV	=	0.11272784E	03

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ATLANTIC MARINE SYSTEMS, INC.

Form - 1413 PRINTED IN U.S.A.

1	AUG.	1969	22	HR	22 MIN	24.98 SEC	TNST	631020.6953	J.D.	244 435.4322	7 DAY	7 HR 17.0 MIN		
X	=	-0.14776726E 08	XD	=	-0.52987668E 04	ALT	=	0.14069350E 06	LAT	=	0.18611930E 02	VI	=	0.84606552E 04
Y	=	0.13435450E 08	YD	=	-0.60962014E 04	R	=	0.21059340E 08	LONG	=	0.21177347E 03	FPAI	=	-0.65845832E 01
Z	=	0.66807814E 07	ZD	=	-0.25183498E 04	RDOT	=	-0.97018210E 03	FLP	=	0.85526862E 04	PSIV	=	0.10610134E 03
XL	=	-0.14802631E 08	TAG	=	0.60000000E 01	GLOAD	=	0.2462463E 01	FLY	=	0.84698248E 03	VA	=	0.70840088E 04
YL	=	0.13229952E 08	ROLL	=	0.84344372E 02	ACC	=	0.79489397E 02	RTGN	=	0.36001130E 01	FPAIA	=	-0.78716111E 01
ZL	=	0.66133917E 07	RDOT	=	0.39308114E 01	DRAG	=	0.21486307E 05	RTGL	=	0.27966851E 02	PSAV	=	0.10940100E 03

1	AUG.	1969	22	HR	22 MIN	29.98 SEC	TNST	631025.6953	J.D.	244 435.4322	7 DAY	7 HR 17.0 MIN		
X	=	-0.14802379E 08	XD	=	-0.495644696E 04	ALT	=	0.13561250E 06	LAT	=	0.18581816E 02	VI	=	0.81036966E 04
Y	=	0.13405233E 08	YD	=	-0.59863087E 04	R	=	0.21054281E 08	LONG	=	0.21186624E 03	FPAI	=	-0.74714312E 01
Z	=	0.66687281E 07	ZD	=	-0.22950854E 04	RDOT	=	-0.10537384E 04	FLP	=	0.96366697E 04	PSIV	=	0.10491295E 03
XL	=	-0.14807454E 08	TAG	=	0.60000000E 01	GLOAD	=	0.27581126E 01	FLY	=	-0.24299847E 03	VA	=	0.67213917E 04
YL	=	0.13224554E 08	ROLL	=	0.91444431E 02	ACC	=	0.89097876E 02	RTGN	=	0.33886707E 01	FPAIA	=	-0.90196848E 01
ZL	=	0.66133917E 07	RDOT	=	0.	DRAG	=	0.24098833E 05	RTGL	=	0.22468233E 02	PSAV	=	0.10814935E 03

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18															
17															
16															
15	X	=	-0.14826230E 08	XD	=	-0.45772290E 04	ALT	=	0.13011475E 06	LAT	=	0.18555472E 02	VI	=	0.77016577E 04
14	Y	=	0.13375640E 08	YD	=	-0.58455502E 04	R	=	0.21048802E 08	LONG	=	0.21195423E 03	FPAI	=	-0.849946284E 01
13	Z	=	0.66578712E 07	ZD	=	-0.20479173E 04	RDOT	=	-0.11383015E 04	FLP	=	0.10739618E 05	PSIV	=	0.10350825E 03
12															
11															
10															
9	XL	=	-0.14812275E 08	TAG	=	0.60000000E 01	GLOAD	=	0.31116892E 01	FLY	=	-0.17186612E 04	VA	=	0.63140326E 04
8	YL	=	0.13219154E 08	ROLL	=	0.99091953E 02	ACC	=	0.10049097E 03	RTGN	=	0.31825302E 01	FPAIA	=	-0.10386135E 02
7	ZL	=	0.66133917E 07	RDOT	=	0.	DRAG	=	0.27190670E 05	RTGL	=	0.17304241E 02	PSAV	=	0.10664763E 03

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ADORE BUSINESS FORMS, INC.

FORM 1410 EDITION 1, 1964

X	-0.14690527E 08	XD	= -0.61609333E 04	ALT	= 0.15349175E 06	LAT	= 0.18721542E 02	V1	= 0.93269813E 04
Y	= 0.13528620E 08	YD	= -0.62995957E 04	R	= 0.21072057E 08	LONG	= 0.21147200E 03	FPAI	= -0.44575547E 01
Z	= 0.67228307E 07	TD	= -0.30578712E 04	RDOT	= -0.72489809E 03	FLP	= 0.61086214E 04	PSIV	= 0.10870751E 03
XL	= -0.14788152E 08	IAG	= 0.60000000E 01	GLOAD	= 0.18224974E 01	FLY	= 0.17345795E 04	VA	= 0.79662224E 04
YL	= 0.13246135E 08	ROLL	= 0.74147785E 02	ACC	= 0.60508469E 02	RIGN	= 0.42334092E 01	FPAAA	= -0.52209325E 01
ZL	= 0.66133917E 07	RDOTI	= 0.	DRAG	= 0.15875300E 05	RTGL	= 0.46124704E 02	PSAV	= 0.11208292E 03
X	-0.14720675E 08	XD	= -0.58949781E 04	ALT	= 0.14963275E 06	LAT	= 0.18682097E 02	V1	= 0.90663113E 04
Y	= 0.13497243E 08	YD	= -0.62429022E 04	R	= 0.21068227E 08	LONG	= 0.21157591E 03	FPAI	= -0.51074438E 01
Z	= 0.67079342E 07	TD	= -0.28977934E 04	RDOT	= -0.80711658E 03	FLP	= 0.67891772E 04	PSIV	= 0.10796844E 03
XL	= -0.14792980E 08	IAG	= 0.60000000E 01	GLOAD	= 0.19966478E 01	FLY	= 0.15403107E 04	VA	= 0.77005821E 04
YL	= 0.13240743E 08	ROLL	= 0.77217274E 02	ACC	= 0.65609169E 02	RIGN	= 0.40297966E 01	FPAAA	= -0.60163575E 01
ZL	= 0.66133917E 07	RDOTI	= 0.	DRAG	= 0.17404289E 05	RTGL	= 0.39823996E 02	PSAV	= 0.11133173E 03
XL	-0.14749445E 08	XD	= -0.56091140E 04	ALT	= 0.14536650E 06	LAT	= 0.1864563E 02	V1	= 0.81794573E 04
YL	= 0.134666157E 08	YD	= -0.61826085E 04	R	= 0.21063988E 08	LONG	= 0.21167653E 03	FPAI	= -0.58111821E 01
ZL	= 0.66938841E 07	TD	= -0.27188352E 04	RDOT	= -0.88892409E 03	FLP	= 0.76072288E 04	PSIV	= 0.1073892E 03
XL	= -0.14797807E 08	IAG	= 0.60000000E 01	GLOAD	= 0.22096957E 01	FLY	= 0.124668216E 04	VA	= 0.74084161E 04
YL	= 0.13235348E 08	ROLL	= 0.80692005E 02	ACC	= 0.71908292E 01	RIGN	= 0.38174672E 01	FPAAA	= -0.68914294E 01
ZL	= 0.66133917E 07	RDOTI	= 0.	DRAG	= 0.19271821E 05	RTGL	= 0.33762644E 02	PSAV	= 0.11044852E 03

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MOORE BUSINESS SYSTEMS, INC.

FORM 1423 EDITION 10 U.S.A.

1 AUG. 1969 22 HR 22 MIN 39.98 SEC TMSI 631035.6953 J.D. 244 435.4323 7 DAY 7 HR 17.2 MIN

X	= -0.14848076E .08	XD	= -0.41522693E .04	ALT	= 0.12418725E .06	LAT	= 0.18533231E .02	VI	= 0.72481827E .04
Y	= 0.13346839E .08	YD	= -0.56618738E .04	R	= 0.21042691E .08	LONG	= 0.21203670E .03	FPAI	= -0.97509094E .01
Z	= 0.66482935E .07	ZD	= -0.17804548E .04	RDOT	= -0.12275895E .04	FLP	= 0.11663679E .05	PSIV	= 0.10185720E .03
XL	= -0.14817094E .08	TAG	= 0.60000000E .01	GLOAD	= 0.34851541E .01	FLM	= -0.35102194E .04	VA	= 0.58565807E .04
YL	= 0.13213753E .08	ROLL	= 0.10674932E .03	ACC	= 0.11253579E .03	RIGN	= 0.30105542E .01	FPAIA	= -0.12099409E .02
ZL	= 0.66133917E .07	RLDOT	= 0.	DRAG	= 0.30451094E .05	RTGL	= 0.12518441E .02	PSAV	= 0.10485162E .03

1 AUG. 1969 22 HR 22 MIN 44.98 SEC TMSI 631040.6953 J.D. 244 435.4324 7 DAY 7 HR 17.3 MIN

X	= -0.14867663E .08	XD	= -0.36730670E .04	ALT	= 0.11779550E .06	LAT	= 0.18515358E .02	VI	= 0.67374378E .04
Y	= 0.13319036E .08	YD	= -0.54448663E .04	R	= 0.21036512E .08	LONG	= 0.21211274E .03	FPAI	= -0.11345344E .02
Z	= 0.66400859E .07	ZD	= -0.15016920E .04	RDOT	= -0.13254032E .04	FLP	= 0.12443894E .05	PSIV	= 0.99952614E .02
XL	= -0.14821911E .08	TAG	= 0.60000000E .01	GLOAD	= 0.39087180E .01	FLY	= -0.56659883E .04	VA	= 0.53451518E .04
YL	= -0.13208349E .08	ROLL	= 0.11648085E .02	ACC	= 0.12597036E .03	RIGN	= 0.28909812E .01	FPAIA	= -0.14357036E .02
ZL	= 0.66133917E .07	RLDOT	= 0.49946645E .01	DRAG	= 0.34182775E .05	RTGL	= 0.81600195E .01	PSAV	= 0.10273732E .03

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1 AUG.	1969	22 HR 22 MIN 54.98 SEC TMSI	631050.6953 J.D. 244 435.4325	7 DAY 7 HR 17.5 MIN
X	= -0.148988856E 08	XD	= -0.25215999E 04	ALT = 0.10335975E 06 LAT = 0.18492543E 02 VI = 0.55256324E 04
Y	= 0.13267517E 08	YD	= -0.48060594E 04	R = 0.21022093E 08 LONG = 0.21224095E 03 FPAI = -0.16545599E 02
Z	= 0.66276331E 07	ZD	= -0.10372757E 04	RDOT = -0.15731181E 04 FLP = 0.46725455E 04 PSIV = 0.96181932E 02
X1	= -0.14831538E 08	TAG	= 0.60000000E 01	GLOAD = 0.46911068E 01 FLY = -0.15747608E 05 VA = 0.41625446E 04
Y1	= 0.13197538E 08	ROLL	= 0.16347360E 03	ACC = 0.15232003E 03 RTGN = 0.29130806E 01 FPAA = -0.22205034E 02
Z1	= 0.66133917E 07	RLDOT	= 0.	DRAG = 0.41065485E 05 RTGL = 0.92373970E 00 PSAV = 0.98511652E 02

1 AUG.	1969	22 HR 22 MIN 59.98 SEC TMSI	631055.6953 J.D. 244 435.4326	7 DAY 7 HR 17.5 MIN
X	= -0.14909919E 08	XD	= -0.19107560E 04	ALT = 0.95213000E 05 LAT = 0.18486001E 02 VI = 0.48381192E 04
Y	= 0.13244583E 08	YD	= -0.43542766E 04	R = 0.21013951E 08 LONG = 0.21229040E 03 FPAI = -0.20192156E 02
Z	= 0.66228015E 07	ZD	= -0.89257161E 03	RDOT = -0.16699722E 04 FLP = 0.50040128E 04 PSIV = 0.94875545E 02
X1	= -0.14836349E 08	TAG	= 0.60000000E 01	GLOAD = 0.49050336E 01 FLY = -0.16425759E 05 VA = 0.35161171E 04
Y1	= 0.13192129E 08	ROLL	= 0.16305694E 03	ACC = 0.15577684E 03 RTGN = 0.304111653E 01 FPAA = -0.28355946E 02
Z1	= 0.66133917E 07	RLDOT	= 0.	DRAG = 0.42927681E 05 RTGL = -0.18508532E 01 PSAV = 0.97164865E 02

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MUORE BUSINESS FORMS, INC.

FORM 1413 FEDERAL U.S.A.

1	AUG.	1969	22	HR	23	MIN	9.98	SEC	TMSI	631065.6953	J.D.	244 435.4327	7	DAY	7	HR	17.7	MIN	F1	
X	=	-0.14923746E 08	XD	=	-0.92769611E 03	ALT	=	0.78598000E 05	LAT	=	0.18479847E 02	VI	=	0.34626904E 04	91					SL
Y	=	0.13206291E 08	YD	=	-0.32849212E 04	R	=	0.20997341E 08	LONG	=	0.21235733E 03	FPAI	=	-0.27336322E 02	6:					C1
Z	=	0.66154373E 07	2D	=	-0.58214931E 03	RDDT	=	-0.15901117E 04	FLP	=	0.46220362E 04	PSIV	=	0.91593226E 02	C2					C3
XL	=	-0.14845965E 08	TAG	=	0.60000000E 01	GLOAD	=	0.45398037E 01	FLY	=	-0.15171914E 05	VA	=	0.22727692E 04						
YL	=	0.13181307E 08	ROLL	=	0.16305694E 03	ACC	=	0.13579485E 03	RTGN	=	0.3409094E 01	FPAAA	=	-0.44397806E 02						
ZL	=	0.66133917E 07	RDDT	=	0.	DRAG	=	0.39650837E 05	RTGL	=	-0.54981952E 01	PSAV	=	0.93018920E 02						
1	AUG.	1969	22	HR	23	MIN	14.98	SEC	TMSI	631070.6953	J.D.	244 435.4327	7	DAY	7	HR	17.8	MIN		
X	=	-0.14927575E 08	XD	=	-0.62717861E 03	ALT	=	0.71023250E 05	LAT	=	0.18479334E 02	VI	=	0.28669732E 04						
Y	=	0.13191198E 08	YD	=	-0.27614935E 04	R	=	0.20989767E 08	LONG	=	0.21237625E 03	FPAI	=	-0.29930178E 02						
Z	=	0.66128714E 07	2D	=	-0.44758923E 03	RDDT	=	-0.14304599E 04	FLP	=	0.40172208E 04	PSIV	=	0.89925158E 02						
XL	=	-0.14850710E 08	TAG	=	0.60000000E 01	GLOAD	=	0.39479838E 01	FLY	=	-0.13186597E 05	VA	=	0.17638518E 04						
YL	=	0.13175893E 08	ROLL	=	0.16305694E 03	ACC	=	0.11223240E 03	RTGN	=	0.35960110E 01	FPAAA	=	-0.54192395E 02						
ZL	=	0.66133917E 07	RDDT	=	0.	DRAG	=	0.34462336E 05	RTGL	=	-0.64725484E 01	PSAV	=	0.89819608E 02						

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CAFE BUSINESS FARMING INC.

Form - 1413 PRINTED IN U.S.A.

		1 AUG. 1969 22 HR 23 MIN 24.98 SEC TMST		631080.6953 J.D. 244 435.4328		7 DAY 7 HR 18.0 MIN			
X	= -0.14932305E 08	XD	= -0.38457665E 03	ALT	= 0.58669000E 05	LAT	= 0.18480487E 02	V1	= 0.20139153E 04
Y	= 0.13167922E 08	YD	= -0.19577321E 04	R	= 0.20977411E 08	LONG	= 0.21239368E 03	FPAI	= -0.31143990E 02
Z	= 0.66093197E 07	ZD	= -0.27429984E 03	RDOT	= -0.10415780E 04	FLP	= 0.27241679E 04	PSIV	= 0.88112824E 02
X1	= -0.14860374E 08	JAG	= 0.60000000E 01	GLOAD	= 0.26771047E 01	FLY	= -0.89421287E 04	VA	= 0.10777329E 04
Y1	= 0.13165060E 08	ROLL	= 0.16305694E 03	ACC	= 0.62959460E 02	RTGN	= 0.37634748E 01	FPAA	= -0.75117021E 02
Z1	= 0.66133917E 07	RDOT	= 0.	DRAG	= 0.23369687E 05	RTGL	= -0.73503159E 01	PSAV	= 0.78167122E 02

		1 AUG. 1969 22 HR 23 MIN 29.98 SEC TMST		631085.6953 J.D. 244 435.4329		7 DAY 7 HR 18.0 MIN			
X	= -0.14934188E 08	XD	= -0.37691698E 03	ALT	= 0.53899500E 05	LAT	= 0.18481162E 02	V1	= 0.17537684E 04
Y	= 0.13158823E 08	YD	= -0.16958699E 04	R	= 0.20972641E 08	LONG	= 0.21239602E 03	FPAI	= -0.29789662E 02
Z	= 0.66081094E 07	ZD	= -0.24012971E 03	RDOT	= -0.87130261E 03	FLP	= 0.22558214E 04	PSIV	= 0.88635306E 02
X1	= -0.14865173E 08	JAG	= 0.60000000E 01	GLOAD	= 0.22151736E 01	FLY	= -0.74047731E 04	VA	= 0.87487154E 03
Y1	= 0.13159641E 08	ROLL	= 0.16305694E 03	ACC	= 0.44861619E 02	RTGN	= 0.36593868E 01	FPAA	= -0.84822606E 02
Z1	= 0.66133917E 07	RDOT	= 0.	DRAG	= 0.192351906E 05	RTGL	= -0.75184823E 01	PSAV	= 0.62666817E 02

		EV 2			
19	08 0	4.9995750E 04	LESS THAN	5.0000000E 04	-0. -0. -0.
18	61 700	-0.	-0.	-0.	-0.
17	20	-0.	-0.	-0.	-0.
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